

WASHINGTON NATIONAL GUARD
LIMITED SITE CHARACTERIZATION
DRAFT REPORT
TOPPENISH FACILITY
TOPPENISH, WASHINGTON

September 1992

Prepared for:

Washington State National Guard
Tacoma, Washington

Project 626121

Prepared by:

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USEPA REG



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1 INTRODUCTION

This Limited Site Characterization Report has been prepared to address an underground storage tank (UST) release at the Washington National Guard (WNG) facility located at 326 Division Street in Toppenish, Washington. The location of the site is shown in Figure 1. The release consisted of an unknown quantity of heating oil that was stored in a 500 gallon steel UST on site.

1.1 Purpose

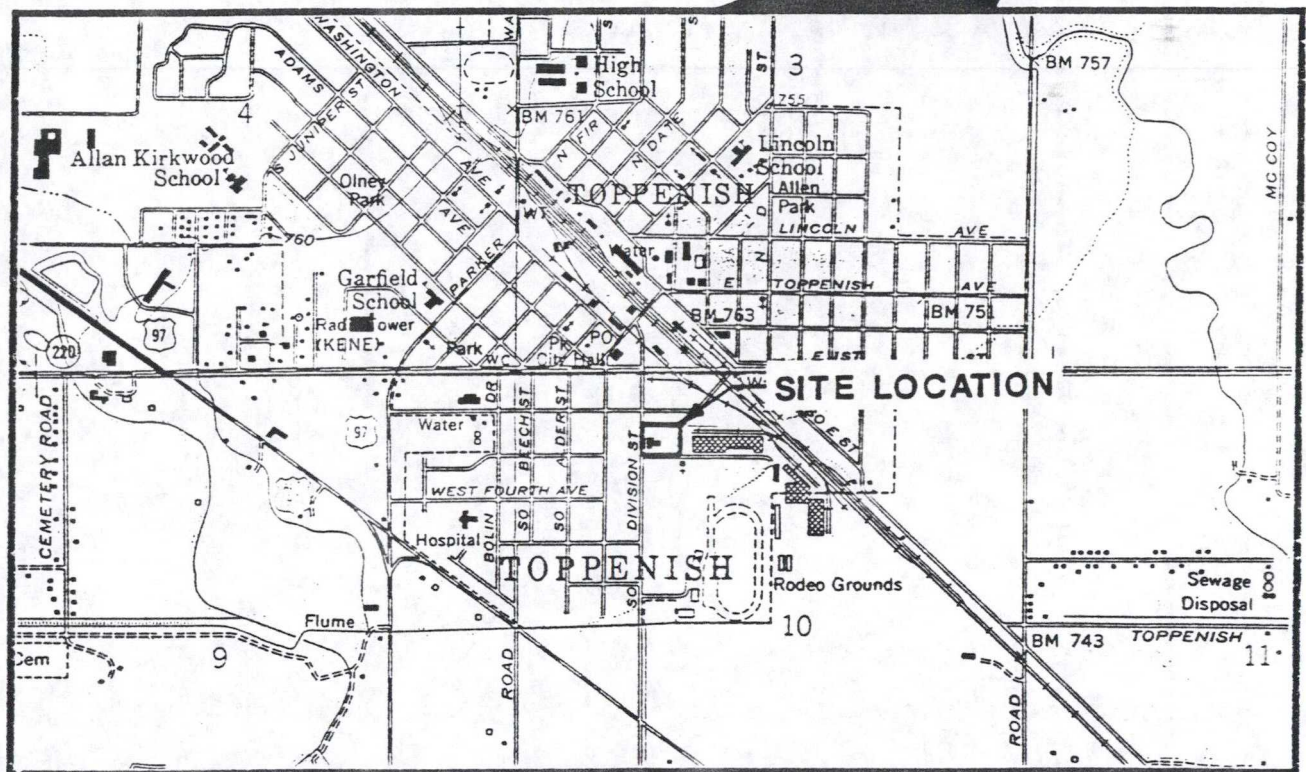
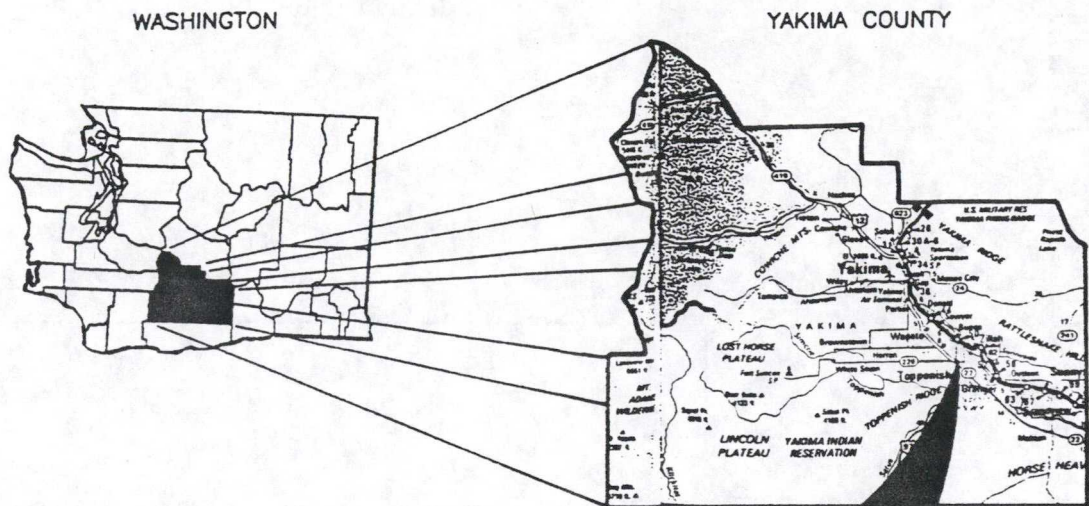
The purpose of this study is to assess the extent of the contamination resulting from the heating oil leak, estimate the extent of free hydrocarbon product and identify the potential for impacts to area groundwater. Recommendations for additional investigative actions and remedial measures are included under separate cover titled Proposed Additional Site Characterization and Interim Product Recovery Measures, Washington National Guard Facility, Toppenish, Washington.

1.2 Background

In April 1992, the National Guard contacted Burlington Environmental Inc. (Burlington Environmental) to remove five USTs from the Toppenish facility. The excavated areas and former tank locations are shown in Figure 2. During UST removal, discolored soils were encountered adjacent to Tank No. T2-E and extended to Tank T2-C (see Figure 2). One sample from these soils adjacent to Tank No. T2-E and one sample from under Tank No. T2-C were obtained. The samples were analyzed for total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, total xylenes (BTEX), and priority pollutant metals (PPM). Only TPH (diesel-range) was detected above detection limits at 5,900 parts per million (ppm) and 2,600 ppm, at Tanks T2-E and T2-C, respectively. WNG informed Burlington Environmental 9/92/b39:1780.rpt(6121)

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SCALE IS VARIABLE



Burlington Environmental Inc.

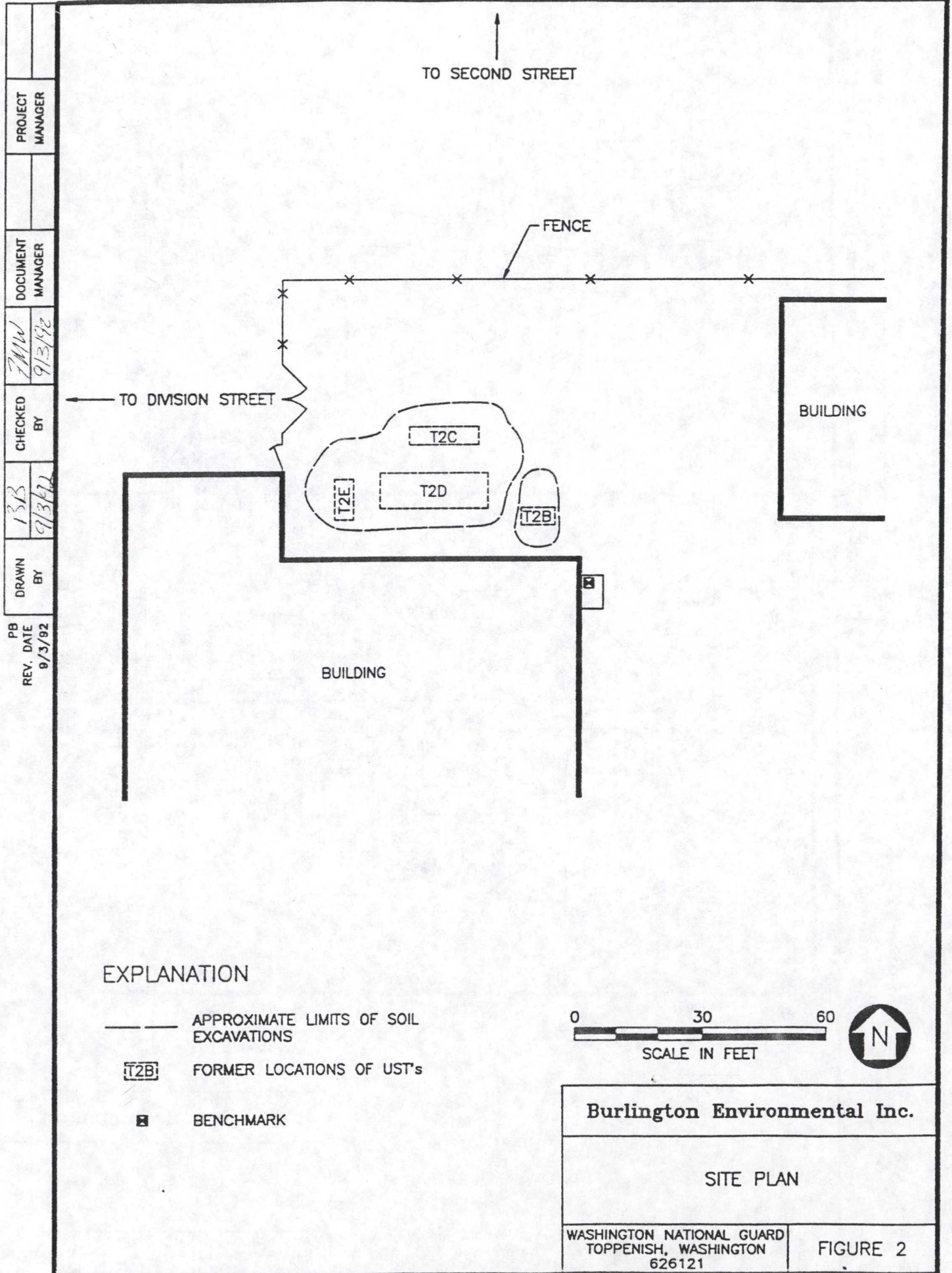
SITE LOCATION MAP

Modified from U.S. Geological Survey, Hembre Mountain, and Toppenish, Washington quadrangle photorevised 1985.

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FIGURE 1

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that Tank No. T2-E (500-gallon capacity) was used for heating oil storage and Tank No. T2-C (3000-gallon capacity) was used for unleaded fuel storage. After removal, the tanks were visually inspected. Tank No. T2-E was observed to have a hole approximately $\frac{3}{4}$ -inch in diameter on one end of the tank.

In order to remove all impacted soil above the groundwater (approximately 11 feet below the existing grade), 250 cubic yards of soil were excavated and removed from the site. Soil samples from the excavation sidewalls were analyzed for TPH. Contamination was not detected. However, an oil sheen was noted on the groundwater surface.

1.3 Regulatory Setting

Since the facility is located on Indian land, a release from a UST is regulated by the U.S. Environmental Protection Agency (USEPA). The Washington State Department of Ecology (Ecology) and USEPA were notified of the release on May 20, 1992. USEPA subsequently directed WNG and Burlington Environmental to adhere to the Ecology requirements and procedures. Therefore, this investigation was conducted as an independent remedial action in accordance to the Washington State Model Toxics Control Act (MTCA), WAC 173-340. The USEPA was consulted by Burlington Environmental so that the planning and execution of this investigation met their approval.

2 SITE CHARACTERIZATION

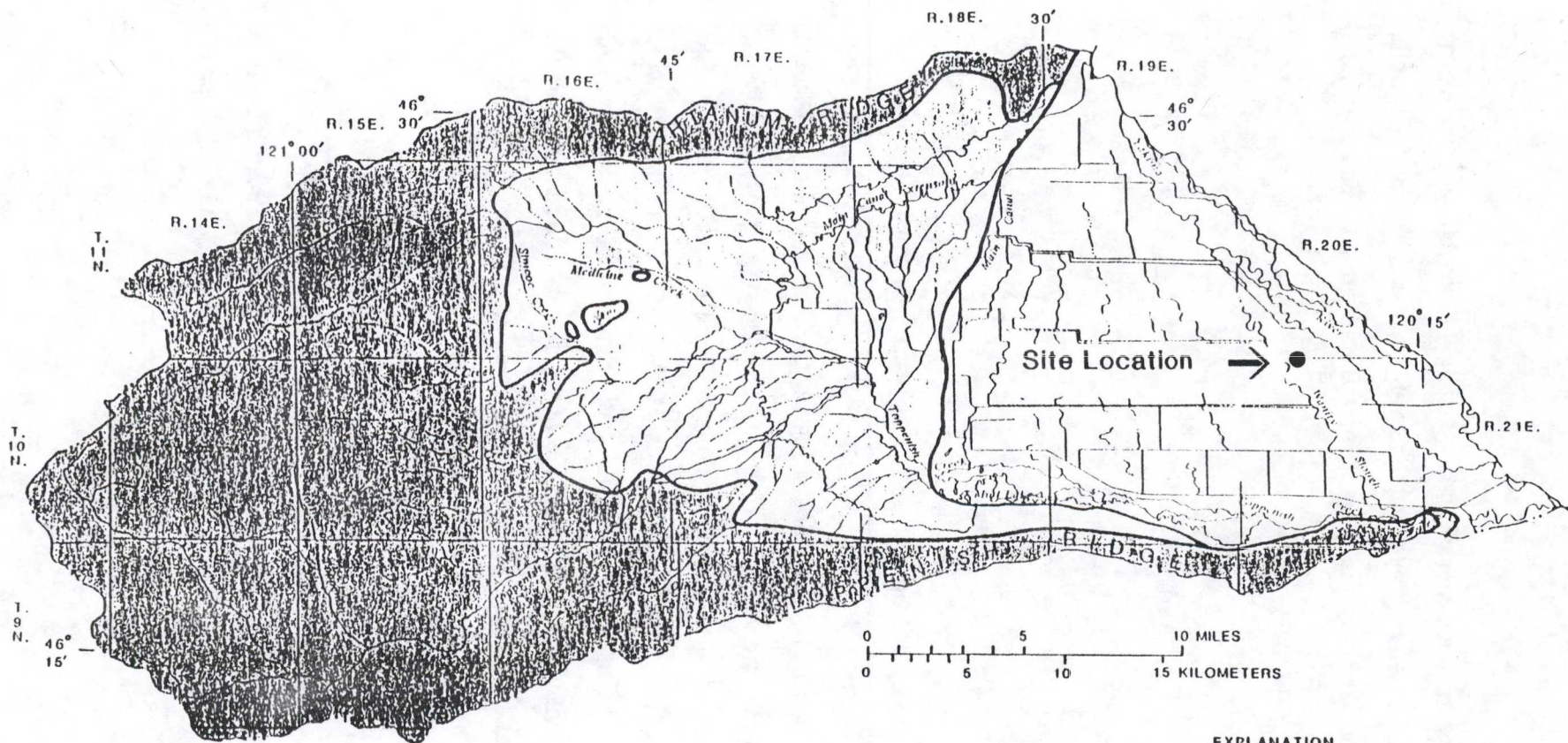
2.1 Regional Geology and Hydrology

The site is located within the eastern portion of Toppenish Creek Basin (TC Basin) in South-Central Washington (see Figure 3). The TC Basin is bounded by the Toppenish ridge to the south, the Cascade Range to the west, and the Ahtanum Ridge to the north and east. The basin comprises a drainage area of approximately 627 square miles, and ranges in elevation from 5100 feet at the western drainage divide to 750 feet on the eastern valley floor along the Yakima River.

The TC Basin contains four principal hydrostratigraphic units: 1) deep basalt, 2) primary basalt, 3) confined old valley fill and basalt, and 4) young valley fill (Skrivan, 1987). The deep and primary basalt units are a layered sequence that has a minimum thickness of 2000 feet and underlies the entire TC Basin. The old valley fill consists of partially consolidated gravels, sands, silts and clays of the Ellensburg formation of Miocene Age. This unit is thought to attain a maximum thickness of 1000 feet in the east-central part of the TC basin. The young valley fill unit is confined to the eastern third of the TC Basin. This unit, which includes recent alluvium and the upper part of the Ellensburg formation, consists of gravel, cemented gravel, sand and silt, and attains a maximum thickness of 500 feet west of Toppenish in the Wapato area.

2.2 Site Geology and Hydrology

The upper stratigraphic unit at the site consists of unconsolidated gravels, sands and silts with minor clay. These recent alluvial sediments comprise the upper part of the young valley aquifer.



Base from U. S. Geological Survey
Yakima, 1:250,000

EXPLANATION

- Young valley fill. More than 50 feet thick, underlain in most places by old valley fill and in some places by basalt.
- Old valley fill. At or within 50 feet of land surface, underlain everywhere by basalt.
- Basalt. At or within 50 feet of land surface.
- Basin boundary

FIGURE 3. Toppenish Creek Basin – Generalized Areal Geology
(From U.S. Geological Survey, 1975)

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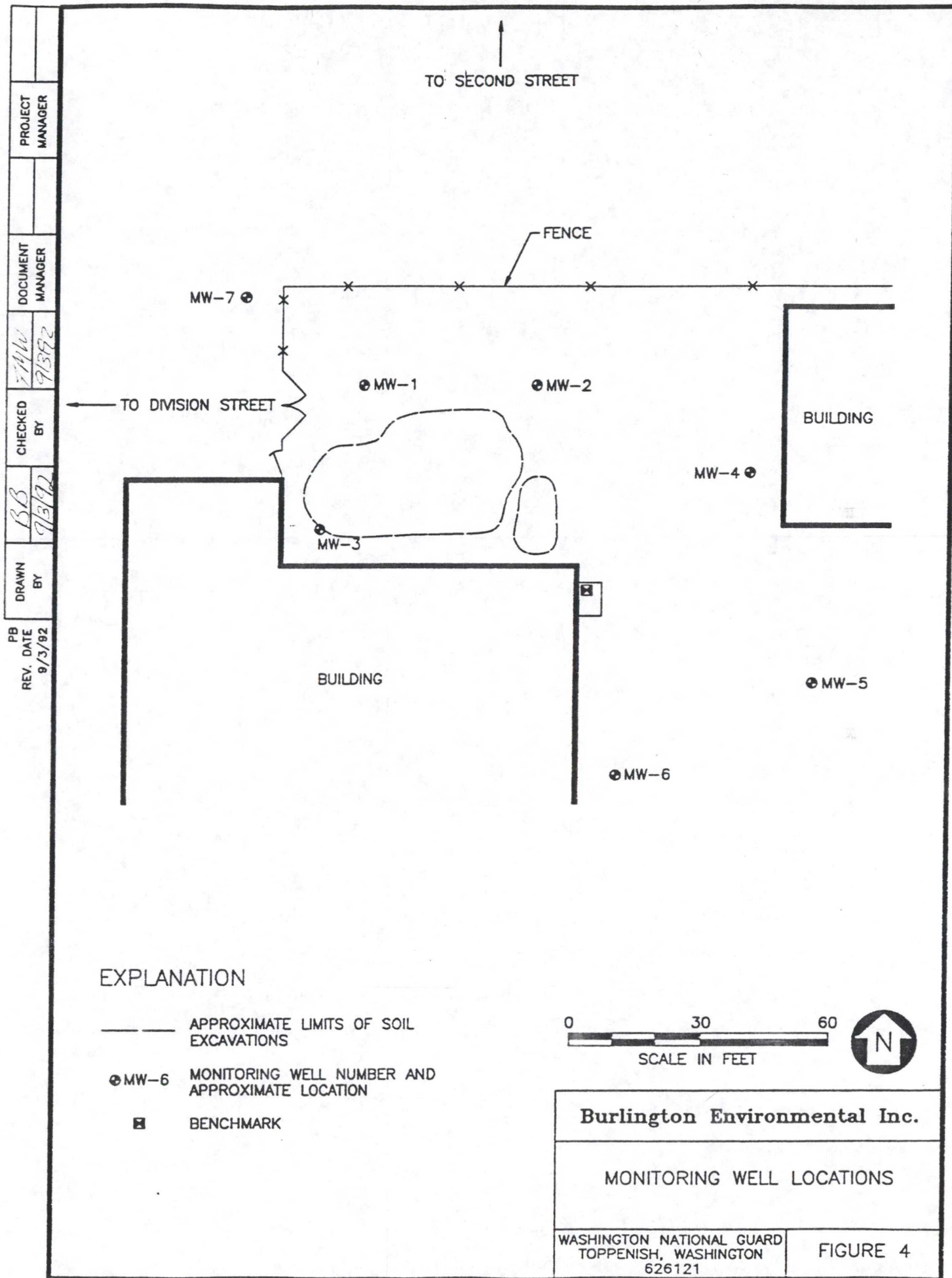
Groundwater at the site occurs at a depth of approximately 11 feet below grade in the seven monitoring wells installed. Relative groundwater elevations measured in these wells indicate a south to southeast groundwater flow direction across the site with an average gradient of .001 feet/feet.

2.3 Subsurface Exploration

2.3.1 Drilling and Soil Sampling

Seven monitoring wells were installed on the site at the locations shown in Figure 4. All drilling was completed with a Dietrich D-50 drill rig using 4 1/4-inch inside-diameter hollow-stem augers. A Burlington Environmental field geologist logged the borings and classified the soil samples in accordance with American Standard Testing Method (ASTM) D-2488-84, "Standard Practice for Description and Identification of Soils" (Visual-Manual Method). The detailed boring logs are presented in Appendix A. Wells MW-1, MW-2 and MW-3 were installed at the proposed locations indicated in the original Field Sampling and Analysis Plan. After installation, each well was checked for the presence of light non-aqueous phase liquid (LNAPL). Due to the presence of LNAPL or a hydrocarbon sheen in all three wells, MW-4 was drilled farther downgradient than initially planned. An upgradient well (MW-7) and two additional downgradient wells (MW-5, MW-6) were approved by WNG at this time.

Soil samples were obtained from immediately above the water table in each well utilizing the approved techniques and equipment specified in the Standard Penetration Test (ASTM-1586-84) and Burlington Environmental standard operating procedures. The Standard Penetration Test (SPT) includes driving a two or three inch outside diameter split-barrel sampler ahead of



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MONITORING WELL LOCATIONS	
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the auger through undisturbed soils by dropping a 140-pound hammer falling a vertical distance of 30 inches. Typically, each sample was obtained by 18 to 24 inches of penetration and the number of blows for each six-inch increment recorded. The recorded blow counts are shown on the boring logs. Additional description of the drilling, sampling and well installation procedures are included in Appendix B.

A portion of each soil sample was collected in a laboratory-prepared sample jar for laboratory analysis. The remainder of the sample was used for visual classification and for field screening. The field screening consisted of examining each sample for the presence of organic vapors using a photoionization detector (PID). The field screening does not provide quantitative data. However, it is an effective tool in determining the relative level of contamination.

2.3.2 Well Construction and Sampling

All monitoring wells were constructed using 2" diameter flush-threaded, schedule-40 PVC casing and well screens. The bottom 10 feet of each casing string consisted of factory-slotted (0.010-inch slots) well screen. Above the screen section, blank casing was installed to the top of the well at the ground surface. The screen length was chosen so that the presence of LNAPL could be detected in each monitoring well. Each well was completed with a filter pack consisting of 10-20 Colorado silica sand. All wells were installed with flush-mounted protective casings. Well completion information detailing the construction specifications of the seven monitoring wells is included in the Well Completion Reports, Appendix C.

Following the well construction, the wells were surveyed for location relative to each other and the surrounding buildings, and for elevation relative to an arbitrarily assigned bench mark. The bench mark was chosen on the northwest corner of the concrete pad approximately 45 feet north of well MW-6, and was assigned an elevation of 100.00 feet. The location of the

bench mark is shown on Figure 4. All other elevations noted on figures, tables and borings logs within this report are referenced relative to this bench mark.

After construction, each of the wells was checked for the presence of LNAPL using an electronic oil/water interface probe. LNAPL was detected in wells MW-1, MW-2 and MW-3. Well MW-3 had approximately 0.01 inches of LNAPL. Wells MW-1 and MW-2 had LNAPL accumulations estimated to be less than 0.01 inches thick (i.e. a hydrocarbon sheen).

Water levels were recorded in all wells at this time. The depth to water in each well was then corrected to relative elevation using the established on-site datum. A summary of ground water elevation and survey data is presented in Table 1. Contouring of the water elevations indicates a south to southeast groundwater flow direction at the time of measurement, with a gradient of 0.001. The interpreted groundwater surface contour map is shown in Figure 5.

Wells MW-4, -5, -6 and -7 were developed using a hand rod pump. Wells MW-1, MW-2 and MW-3 were not developed due the presence of LNAPL. Well development is a process of cleaning the well filter pack and screen to increase the efficiency of the well and to reduce the potential effects of drilling on the water chemistry. During the drilling process, clay and silt can smear along the walls of the borehole and reduce permeability in this area. Standard Burlington Environmental protocol dictates that a minimum of three well volumes be purged and field parameters (pH, temperature and conductivity) stabilize prior to sampling. For wells MW-5, MW-6 and MW-7, a volume of 35 gallons was developed in order to adequately prepare the wells for sampling. Well MW-7 required an additional 5 gallons to be purged due to the presence of excess turbidity in the water after three well volumes had been removed.

Groundwater samples were collected from wells MW-4, -5, -6 and -7 immediately following development and were submitted to the Sound Analytical Laboratories for analysis. The analytical parameters included TPH by Washington state Method WTPH-D, BTEX by USEPA Method 8020, total lead by USEPA Method 6010 or 7421, and dissolved lead by USEPA Method 7421. Samples collected for dissolved lead were field filtered through a 0.45 micron filter.

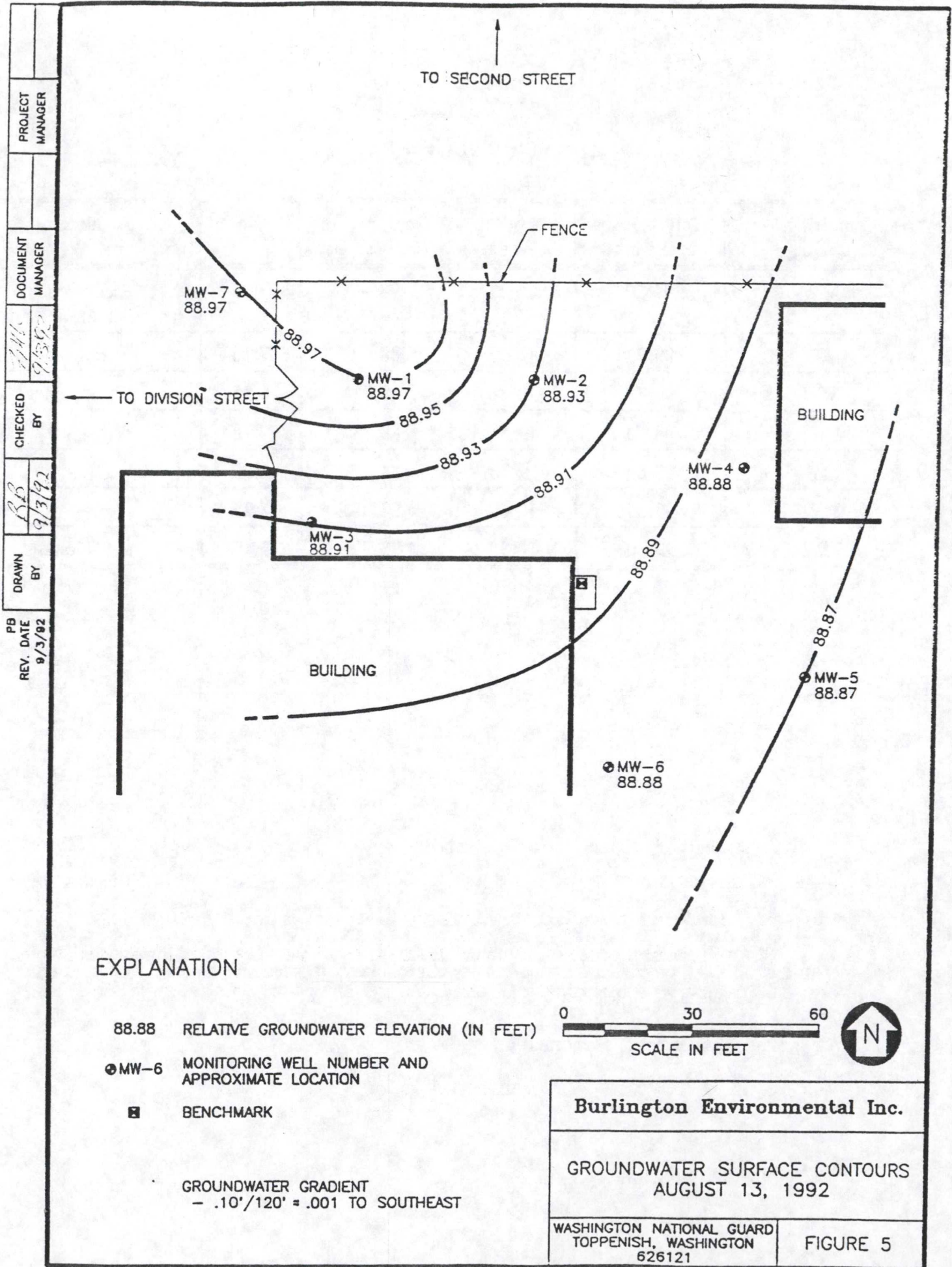
Table 1

SUMMARY OF SURVEY DATA AND GROUNDWATER ELEVATIONS

Monitoring Well No.	Top of Riser Elevation*	Depth to Water	Groundwater Elevation	Time**	Notes
MW-1	99.20	10.23	88.97	7:05	Free product (approximately .01 foot)
MW-2	99.21	10.23	88.93	7:10	Sheen, odor
MW-3	99.79	10.88	88.91	6:55	Sheen, odor
MW-4	98.73	9.85	88.38	7:18	---
MW-5	98.63	9.76	88.87	7:20	---
MW-6	99.55	10.67	88.88	7:25	---
MW-7	99.30	10.33	88.97	7:40	Odor

* Datum established on site at the concrete pad approximately 45 feet north of well MW-6. Assigned an arbitrary elevation of 100.00 feet.

** All groundwater elevations recorded on 8/13/92.



2.3.3 Analytical Results

The results from the soil and groundwater sampling activities are presented below. In addition, the laboratory analytical report and an analytical data review are included in Appendices D and E, respectively. The Chain of Custody documentation is included in Appendix F.

2.3.3.1 Soil

The soils encountered during drilling consisted of silts, sands and gravels. In general, the interval from the surface to a depth of five to eight feet was characterized by clayey to sandy silts and fine sands. Below this to the depth drilled, approximately 20 feet, soils consisted of fine to coarse gravel with sand and traces of silt. The boring logs included in Appendix A detail the specific stratigraphic variations encountered in each well.

Qualitative PID readings were obtained from cuttings on the auger flights and from the soil samples. The only positive PID readings were from well MW-3, with a maximum of 35 units from the augers at a depth of 16 feet. Visible contamination in the form of an oily coating was observed in the soil sample from MW-3. Laboratory analysis of this sample confirmed the presence of TPH in excess of the MTCA cleanup standard of 200 ppm. The TPH contamination in the soil sample from MW-3 likely results from heating oil which leaked from Tank T2-E and mounded on the groundwater surface. The presence of free hydrocarbon product in this well was subsequently confirmed using an oil/water interface probe.

The soil samples collected from MW-1, -2, -4, -5, -6 and -7 revealed limited qualitative or visual evidence of contamination. Analytical testing of soil samples from these wells indicated that TPH levels were below the MTCA cleanup standard of 200 ppm.

Soil samples collected from the monitoring wells were also analyzed for lead. All samples contained lead concentrations well below the MTCA cleanup standard of 250 ppm. A summary of the soil analytical results is presented in Tables 2 and 3.

2.3.3.2 Groundwater

Groundwater was encountered in all seven of the borings completed on the site at an average depth of 11 feet below grade. LNAPL was detected in wells MW-1, MW-2 and MW-3. Thickness of the LNAPL was 0.01 feet or less in all three wells. No LNAPLs were detected in wells MW-4, -5, -6 or -7.

Groundwater samples were collected from MW-4, -5, -6 and -7 and analyzed for TPH, BTEX, total lead (unfiltered) and dissolved lead (filtered). TPH was below MTCA cleanup standards in wells MW-4, MW-6, and MW-7. A TPH level of 1.0 ppm, which equals the MTCA cleanup standard, was recorded for the water sample from MW-5. The results of the groundwater analyses are shown in Tables 4 through 7.

BTEX compounds at levels above the laboratory detection limits of 0.001 ppm were not recorded in any of the samples analyzed. The 0.001 ppm detection limit is well below the MTCA cleanup standard for benzene (0.005 ppm), toluene (0.040 ppm), ethylbenzene (0.030 ppm) and xylene (0.020 ppm).

Levels of dissolved lead were below the MTCA cleanup standard of 0.005 ppm in all filtered groundwater samples analyzed. Total lead levels from unfiltered samples ranged from 0.012 ppm (MW-7) to 0.290 ppm (MW-5). All of these unfiltered samples exceeded the MTCA groundwater standard of 0.005 ppm for lead. It is important to note that all unfiltered samples had residual turbidity. This turbidity consists of finely suspended particulate matter which may have contained quantities of lead sufficient to raise the total lead levels above cleanup standards. The relatively lower levels of lead recorded in water from MW-7 may result from the fact that this well was reportedly purged to lower turbidity levels than the other wells.

Table 2

TOTAL PETROLEUM HYDROCARBONS (TPH)
WASHINGTON STATE METHOD WTPH-D
SOIL SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	Sample Depth (feet)		TPH (mg/kg)
				Top	Bottom	
MW-1	8/11/92	MW1-S1	26374-13	9.5	11.5	12
MW-2	8/11/92	MW2-S1	26374-14	9.5	10.8	24
MW-3	8/11/92	MW3-S1	26374-15	10	11.5	9,900
MW-4	8/12/92	MW4-S1	26374-16	8.5	10.5	26
MW-5	8/12/92	MW5-S1	26374-17	8	10	57
MW-6	8/12/92	MW6-S1	26374-18	8.5	10.5	15
MW-7	8/12/92	MW7-S1	26374-19	9	11	29

Table 3

TOTAL LEAD
USEPA METHOD 6010
SOIL SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	Sample Depth (feet)		Lead (mg/kg)
				Top	Bottom	
MW-1	8/11/92	MW1-S2	26374-20	9.5	11.5	11
MW-2	8/11/92	MW2-S2	26374-21	9.5	10.8	9.2
MW-3	8/11/92	MW3-S2	26374-22	9.5	11.5	7.4
MW-4	8/12/92	MW4-S2	26374-23	8.5	10.5	8.7
MW-5	8/12/92	MW5-S2	26374-24	8	10	9.0
MW-6	8/12/92	MW6-S2	26374-25	8.5	10.5	7.9
MW-7	8/12/92	MW7-S2	26374-26	9	11	8.7

Table 4

TOTAL PETROLEUM HYDROCARBON (TPH)
WASHINGTON STATE METHOD WTPH-D
WATER SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	TPH (mg/kg)
MW-4	8/13/92	MW4-W1	26374-1	.79
MW-5	8/13/92	MW5-W1	26374-2	1.0
MW-6	8/13/92	MW6-W1	26374-3	.62
MW-7	8/13/92	MW7-W1	26374-4	.62

Table 5

BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENE (BTEX)
USEPA METHOD 8020
WATER SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	Benzene (mg/ℓ)	Toluene (mg/ℓ)	Ethylbenzene (mg/ℓ)	Xylene mg/ℓ)
MW-4	8/13/92	MW4-W2A, B	26374-5	<0.001	<0.001	<0.001	<0.001
MW-5	8/13/92	MW5-W2A, B	26374-6	<0.001	<0.001	<0.001	<0.001
MW-6	8/13/92	MW6-W2A, B	26374-7	<0.001	<0.001	<0.001	<0.001
MW-7	8/13/92	MW7-W2A, B	26374-8	<0.001	<0.001	<0.001	<0.001

Table 6

TOTAL LEAD
USEPA METHOD 6010 OR 7421
WATER SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	Lead (mg/l)
MW-4	8/13/92	MW4-W3	26374-9	0.10
MW-5	8/13/92	MW5-W3	26374-10	0.29
MW-6	8/13/92	MW6-W3	26374-11	0.13
MW-7	8/13/92	MW7-W3	26374-12	0.012*

*Method 7421

Table 7

DISSOLVED LEAD
USEPA METHOD 7421
WATER SAMPLE RESULTS SUMMARY

Monitoring Well	Date	Burlington I.D. No.	Lab I.D. No.	Lead (mg/l)
MW-4	8/13/92	MW4-W4	26374-27	<0.005
MW-5	8/13/92	MW5-W4	26374-28	<0.005
MW-6	8/13/92	MW6-W4	26374-29	<0.005
MW-7	8/13/92	MW7-W4	26374-30	<0.005

3 SUMMARY OF FINDINGS

The sampling and observations made at the time of the UST removal, and the subsequent soil and groundwater sampling completed during the Limited Site Characterization investigation, indicate that a leak of heating oil from Tank T2-E has impacted the soils and groundwater at the site. Soil contaminated by downward vertical migration of heating oil appears to have been removed during the tank excavation process. One soil sample, collected from MW-3, exceeded MTCA cleanup standards for TPH. This TPH contamination is likely the result of heating oil which mounded on the groundwater surface and spread radially outward from the mound. This type of migration is typical behavior for LNAPLs on groundwater, and accounts for the presence of contamination immediately above the groundwater surface at a location upgradient from the release. Examination of cuttings and soil samples from wells (MW-1, MW-2, MW-3) located adjacent to the tank excavation suggest that residual soil contamination is likely limited to a thin soil zone above the groundwater surface in the area immediately adjacent to the tank excavation.

Relatively low levels of TPH were detected in soil samples from wells MW-1, -2, -4, -5, -6 and -7. The levels of contamination were less than one-third of the MTCA cleanup standard in all cases. These low levels of contamination occurred in samples collected immediately above the groundwater surface and may have resulted from contact of the soil with a thin layer or sheen of LNAPL migrating on the groundwater surface. A thin LNAPL layer (0.01 inch or less) was detected in wells MW-1 and MW-2. No LNAPL was detected in MW-4, -5, -6 or -7.

Groundwater samples were not collected from well MW-1, MW-2 and MW-3 due to the presence of LNAPL and the potential for LNAPL to cross-contaminate samples. Groundwater samples from wells MW-4, -5, -6, and -7 had TPH detections below (MW-4, -6, -7) or equal to (MW-5) the MTCA cleanup standard of 1.0 ppm. These results indicate that some released heating oil has dissolved in the groundwater. TPH detected in groundwater from upgradient of the release (well MW-7) may result from temporal variations in groundwater flow direction, but a potential upgradient off-site source of contamination cannot be ruled out at this time.

Groundwater that potentially exceeds the MTCA cleanup levels for TPH appears confined to the immediate vicinity of the tank excavation and the area between MW-4 and MW-6 extending down gradient to well MW-5.

BTEX compounds were not detected above the method detection limit (MDL) of 0.001 ppm in any of the water samples analyzed. Likewise, dissolved lead was not detected at the MDL of 0.005 ppm, which corresponds to the MTCA cleanup standard for lead in groundwater. Total lead values from unfiltered samples exceeded the cleanup standard for all samples analyzed. Comparison of total and dissolved lead analyses suggests that excess turbidity in the unfiltered samples is responsible for the elevated lead levels recorded in these samples.

4 LIMITATIONS OF STUDY

This environmental investigation has been prepared for the exclusive use of WNG in evaluating the environmental liabilities associated with the property described in this report. This report has been prepared in accordance with generally accepted environmental consulting practices; no other warranty, express or implied, is made to the professional advice included in this report. This report has not been prepared for use by parties other than WNG or its authorized users, or for uses other than those stated above and as defined in the contract. Completion of the investigation and implementation of related recommendations cannot entirely eliminate the risk that undiscovered environmental liabilities may later become apparent.

Conclusions and recommendations expressed in this report are based in part on information obtained from discrete locations at the times and under the conditions described herein. This information is point-specific and is not considered to be descriptive of conditions over the entire parcel or site. Variations may be expected between, below, and beyond sampling points and changes in the conditions reported may occur with time. Conclusions and recommendations in this report are based in part on the consultants' judgement and expertise and interpolation and extrapolation of the data points.

APPENDIX A

Borehole Logs

BURLINGTON ENVIRONMENTAL INC.
Geologic Log / Record of Subsurface Exploration

Project No.: 626121		Project : National Guard, Toppenish, Washington			
Boring Number:	MW-1	Elevation:	99.7	Date:	8/11/92,
Coordinates:		GWL:	Depth: 10.5	Date/Time: 8/11/92, 8:30	Time: 3:00
Engineer/Geologist:	K. Tahghighi	Depth:	10.6	Date/Time: 8/11/92, 12:30	Air Monitor Type HNU PID
Drilling Methods:	HSA 4-1/4 I.D.				
Driller:	J. Dolan	Helper:	J. Peale	Rig:	

Depth (Ft)	Sample No. and Interval (ft.)	Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor			Drilling Conditions and Remarks
							Units: ppm			
							BZ	BH	S	
				Asphalt and stone		0.5				Top of well riser ELEV. 99.20
5				Brown clayey silt, some fine to medium sand, some fine gravel.	CL	8				
10	SS-1	9.5-11.5	42-49 37-52	1.17	Brown silty fine to coarse sand and fine gravel.	SW/ GW		0	0	0
15						12				
								0	0	NA
20					END OF BORING AT 19'					

NOTES: Stopped drilling at 9:00 and setup on MW-3.

Continued drilling at 11:25. Approximately 0.01 feet of free product encountered.

Completion Date: 8/11/92
Completion Time: 12:20
Boring:

Well Installed: . YES

Well Installation:

Well Protection:

BURLINGTON ENVIRONMENTAL INC.
Geologic Log / Record of Subsurface Exploration

Project No.: 626121		Project: National Guard, Toppenish, Washington	
Boring Number:	MW-2	Elevation:	99.3
Coordinates:		GWL: Depth:	10.5
Engineer/Geologist:	K. Tahghighi	Date/Time:	8/11/92, 15:20
Drilling Methods:	HSA 4-1/4 I.D.	Date/Time:	8/11/92, 16:30
Driller:	J. Dolan	Air Monitor Type:	HNU PID
		Helper:	J. Peale
		Rig:	

Depth (Ft)	Sample No. and Interval (ft.)	Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor			Drilling Conditions and Remarks
							Units: ppm			
							BZ	BH	S	
-				Asphalt and stone		0.5				Top of well riser ELEV. 99.21
- _5				Brown fine to coarse sand and gravel, with some silt.	GW					
_10	SS-1	9.5-10.8	27-50 60/4"				0	0	0	
- _15				Brown-gray fine to coarse gravel, some fine to coarse sand, trace to some silt.	GW	12				
- _20				END OF BORING AT 19'			0	0 NA		

NOTES: Approximately 0.01 feet of free product encountered.
8/13/92: Only sheen and odor present.

Completion Date: 8/11/92
Completion Time: 16:15
Boring:

Well Installed: YES

Well Installation:

Well Protection:

BURLINGTON ENVIRONMENTAL INC.

Geologic Log / Record of Subsurface Exploration

Project No.: 626121			Project: National Guard, Toppenish, Washington		
Boring Number:	MW-3	Elevation:	99.9	Date:	8/11/92,
Coordinates:		GWL:	Depth: 10.5	Date/Time:	8/11/92, 9:35
Engineer/Geologist:	K. Tahghighi	Depth:	10.7	Date/Time:	8/11/92, 11:35
Drilling Methods:	HSA 4-1/4 I.D.	Air Monitor Type: HNU PID			
Driller:	J. Dolan	Helper:	J. Peale	Rig:	

Depth (Ft)	Sample No. and Interval (ft.)		Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor Units: ppm			Drilling Conditions and Remarks
								BZ	BH	S	
-					Asphalt and stone		0.5				First attempt encountered an abandoned steel pipe at 1", at 2'. Offset boring 1'.
-					Brown fine to coarse gravel, some fine to coarse sand.	GW	3				
-					Brown clayey silt, some fine to medium sand, trace fine gravel	CL	6				
-					Brown-gray fine gravel, some fine to coarse sand, trace silt.	GW	9	0	0		
-	SS-1A	9.5-11.5	25-37 42-46	0.83							8 First sample did not have enough soil.
-	SS-1B	10-11.5	18-71-42	1.17							
-					Brown fine to coarse gravel, some fine to coarse sand, trace gravel.	GW	NA	NA			10 S-1B was obtained. TPH soil sample was obtained from S-1B. Lead sample was obtained from both S1-A and S-1B.
-					END OF BORING AT 18.5'						Top of well riser ELEV. 99.79

NOTES: Augers 5' - 10' HNU: 6 BZ <1
 Augers 10' - 15' HNU: 15 BZ = 1
 Augers 16' HNU: 35 BZ <2
 8/11/92 11:35, 0.01' free product encountered.
 8/13/92: Only sheen and odor present.

Completion Date: 8/11/92
 Completion Time: 11:20
 Boring: _____

Well Installed: _____ YES _____

Well Installation: _____

Well Protection: _____

BURLINGTON ENVIRONMENTAL INC.
Geologic Log / Record of Subsurface Exploration

Project No.: 626121		Project: National Guard, Toppenish, Washington			
Boring Number:	MW-4	Elevation:	98.9	Date:	8/12/92
Coordinates:		Depth:	10	Date/Time:	8/12/92, 7:00
Engineer/Geologist:	K. Tahghighi	Depth:	9.8	Date/Time:	8/12/92, 9:10
Drilling Methods:	HSA 4-1/4 I.D.				
Driller:	J. Dolan	Helper:	J. Peale	Rig:	

Depth (Ft)	Sample No. and Interval (ft.)	Blows on Sampler Per 6 in.		Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor			Drilling Conditions and Remarks
								Units: ppm			
								BZ	BH	S	
- - -					Stone		0.2'				Top of well riser ELEV. 98.73
- -					Brown silt, some clay, some fine sand.	ML/CL	2'				
- _5 - -					Brown fine sand, some silt, trace clay.	SP	5'				
- 											
_10 -	SS-1	8.5-10.5	7-8 11-22	1.7	Brown fine to medium sand, some fine to coarse gravel, trace silt.	SW		0	0	0	
- -							12'				
- _-15 -					Brown fine to coarse sand and fine to coarse gravel, trace silt.	GW	17'				
- -											
- _20					Brown coarse to fine gravel, some fine sand, trace silt.	GW		0	0	NA	
					END OF BORING AT 20'						

NOTES: First attempt encountered spoon refusal twice. Offset the hole 3 feet. The first boring was abandoned and the hole was plugged by bentonite chips.

Completion Date: 8/12/92
Completion Time: 8:30
Boring:

Well Installed: YES

Well Installation:

Well Protection:

BURLINGTON ENVIRONMENTAL INC.

Geologic Log / Record of Subsurface Exploration

Project No.: 626121		Project: National Guard, Toppenish, Washington			
Boring Number:	MW-6	Elevation:	approx. 99.9		Date: 8/12/92
Coordinates:		GWL:	Depth:	10.5	Date/Time: 8/12/92, 15:40
					Time: 15:20
Engineer/Geologist:	K. Tahghighi	Depth:		Date/Time:	Air Monitor Tyce HNU PID
Drilling Methods:	HSA 4-1/4 I.D.				
Driller:	J. Dolan		Helper:	J. Peale	Rig:

Depth (Ft)	Sample No. and Interval (ft.)		Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor			Drilling Conditions and Remarks
								Units: ppm			
								BZ	BH	S	
-					Asphalt and stone		0.5				Top of well riser ELEV 99.55
-											
-											
5					Brown silt, some fine to coarse sand, trace clay.	ML	6				
-											
-											
10	SS-1	8.5-10.5	25-40 60-62	1.7	Brown fine to coarse gravel, some fine to coarse sand, trace silt.	GW		0	0	0	Hard drilling from 6'.
-											
-											
-											
15								0	0	NA	
-											
-											
20											
					END OF BORING AT 20'						

NOTES:

Completion Date: 8/12/92
Completion Time: 16:00
Boring:

Well Installed: YES

Well Installation:

Well Protection:

BURLINGTON ENVIRONMENTAL INC.

Geologic Log / Record of Subsurface Exploration

Project No.: 626121			Project: National Guard, Toppenish, Washington		
Boring Number:	MW-5	Elevation:	approx. 99.0	Date:	8/12/92
Coordinates:		GWL:	Depth: 10	Date/Time:	8/12/92, 12:00
Engineer/Geologist:	K. Fahghighi	Depth:	10.7	Time:	11:30
Drilling Methods:	HSA 4-1/4 I.D.			Air Monitor Type: HNU PID	
Driller:	J. Dolan			Helper:	J. Peale
				Rig:	

Depth (Ft)	Sample No. and Interval (ft.)	Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor Units: ppm			Drilling Conditions and Remarks
							BZ	SH	S	
-				Asphalt & stone		0.5				Top of well riser ELEV. 98.63
-										
-				Brown clayey silt, some fine sand.	CL	5				
-										
-				Brown fine sandy silt, some clay.	SM	8				
-										
-										
-										
5										
-										
-										
-										
-										
-										
-										
-										
10	SS-1 8.0-10.0	16-34 35-30	1.4				0	0	0	
-										
-										
-										
-				Brown fine to coarse sand and fine gravel, trace silt.	SW/ GW	12				
-										
-										
-										
-										
-										
-										
-										
15				Brown fine to coarse gravel, some fine to coarse sand, trace silt.	GW					
-										
-										
-										
-										
-										
-										
-										
20				END OF BORING AT 19'						

NOTES:

Completion Date: 8/12/92
 Completion Time: 12:35
 Boring: _____

Well Installed: _____ YES _____

Well Installation: _____

Well Protection: _____

BURLINGTON ENVIRONMENTAL INC.
Geologic Log / Record of Subsurface Exploration

Project No.: 626121		Project: National Guard, Toppenish, Washington	
Boring Number: MW-7	Elevation: approx. 99.8	Date: 8/12/92	
Coordinates:	IGWL: Depth: 10	Date/Time: 8/12/92, 17:20	Time: 17:00
Engineer/Geologist: K. Tangnigni	Depth:	Date/Time:	Air Monitor Type HNU PID
Drilling Methods: HSA 4-1/4 I.D.			
Driller: J. Dolan		Helper: J. Peale	Rig:

Depth (Ft)	Sample No. and Interval (ft.)	Blows on Sampler Per 6 in.	Recovery (Feet)	SAMPLE DESCRIPTION	USCS Symbol	Depth Change (Feet)	Air Monitor			Drilling Conditions and Remarks
							Units: bpm			
							BZ	BH	S	
-				Asphalt and stone		0.5				Top of well riser ELEV. 99.30
-				Brown clayey silt, some fine sand	ML/ CL					
-						5				
-				Brown silty fine to coarse gravel and fine sand.						
-					GW/ SW	9				
-										
10	SS-1	9.0-11.0	17-35 42-84	1.5			0	0	0	
-										
-				Brown fine to coarse gravel and fine to coarse sand, trace silt.	GW					
-										
-										
-										
-										
15										
-										
-										
-										
-										
-										
20							0	0	NA	
				END OF BORING AT 20'						

NOTES: 8/13/92: Slight odor present.

Completion Date: 8/12/92
Completion Time: 19:00
Boring:

Well Installed: YES

Well Installation:

Well Protection:

APPENDIX B

Field Exploration Methods

APPENDIX B

FIELD EXPLORATION METHODS - DRILLING

The seven soil boreholes were drilled by Burlington Environmental Inc. (Burlington Environmental) using hollow-stem auger drilling techniques to penetrate the unconsolidated sediments. All drilling, sampling, and well construction was conducted under the direction of a Burlington Environmental field geologist. The soil samples were logged and classified according to the Unified Soil Classification System. The borehole logs are presented in Appendix A.

Total depths of the boreholes range from 17 to 20 feet below ground surface (see borehole logs for actual depths). Soil samples were collected by driving a 2-inch or 3-inch (outside diameter) split-spoon sampler 18 to 24 inches into undisturbed soil in advance of the auger bit using a 140-pound hammer free-falling a distance of 30 inches.

Part of the sample was sealed in a laboratory-supplied glass sample jar, with a Teflon-lined lid, for laboratory analysis; part of the sample was reserved for field screening. The field screening consisted of sampling for organic vapors using a photoionization detector (PID). The PID readings are listed on the borehole logs in Appendix A. The PID readings were used as a field screening tool only, and did not provide quantitative data but enabled samples to be compared relative to each other.

The samples were labeled, and immediately placed on ice for storage and transport to the laboratory following strict Burlington Environmental chain-of-custody procedures. The augers, other drill tools, and sampling equipment were steam-cleaned between boreholes. All formation cuttings were left on site in sealed drums.

Monitoring wells were installed in all boreholes using flush-threaded two-inch diameter schedule 40, PVC casing and well screen. The bottom of each casing string consisted of a 10-foot section of factory-slotted (0.010-inch slots) well screen. Blank casing was installed from the top of the well screen to ground surface. Washed silica sand (10-20 mesh) was installed in the annulus around the well screen to two feet above the top of the screen. A bentonite seal approximately 1.5 feet-thick was installed above the sand pack. The remaining annulus was filled with granular bentonite. All wells were completed with traffic box covers set in concrete

flush with the ground surface. The northwest corner of the concrete pad, approximately 45 feet north of MW-6, was assigned an elevation value of 100.00 feet. The top of the well casing and adjacent ground surface at each well were surveyed for elevation relative to the assumed datum and for relative location with respect to each other and to site features. Well completion information is presented in Appendix C.

Wells MW-1, MW-2, and MW-3 were not developed due to the presence of LNAPL on the water. Wells MW-4, -5, -6, and -7 were developed using a hand rod pump. The volume removed from the wells equalled a minimum of three times the well volume as calculated using standard Burlington Environmental protocol in which one well volume equals the volume of water in the casing plus the water in the gravel pack, assuming 40 percent effective porosity. For each well, conductivity and temperature showed stability at development completion. The development water was put in drums which were then sealed and staged on site. Following development, a groundwater sample was collected from each well, chilled on ice, and transported to the laboratory following strict chain-of-custody procedures.

Soil and groundwater samples were submitted to Sound Analytical Services, Inc., of Tacoma, Washington, for chemical analysis. The laboratory reports, the analytical data review, and the chain-of-custody records are included in Appendices D, E, and F, respectively.

APPENDIX C

Well Completion Reports

Well Completion Report

Site #: G26121 County Yakima Well #: MW-1
 Site Name: National Guard Topsoil Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental Date Drilled Start: 8/11/92
 Driller: J. Dolan Geologist: K. TAHGHI Date Completed: 8/11/92
 Drilling Method: HSA 4 1/4" I.D. Drilling Fluids (type): _____

Annular Space Details

Elevations - .01 ft.

Type of Surface Seal: CEMENTType of Annular Sealant: GRANULAR BENTONITE

Amount of cement: # of bags _____ lbs. per bag _____

Amount of bentonite: # of bags _____ lbs. per bag _____

Type of Bentonite Seal (Granular, Pellet): GranularAmount of bentonite: # of Bags 2 lbs. per bag 50Type of Sand Pack: 10-20 silica sandSource of Sand: COLORADO silica sandAmount of Sand: # of bags 1 3/4 lbs. per bag 100

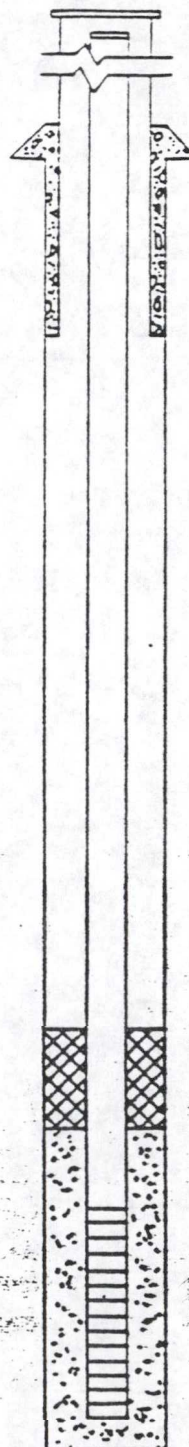
Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			SCH 40	
Riser pipe below w.t.				
Screen			SCH 40	
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	8.5'
Protective casing length	1.5' (FLUSH MOUNT)
Screen length	10'
Bottom of screen to end cap	18.5'
Top of screen to first joint	
Total length of casing	
Screen slot size	0.010"
% of openings in screen	
Diameter of borehole (in)	8"
ID of riser pipe (in)	2"



_____ MSL Top of Protective Casing
 _____ MSL Top of Riser Pipe
 _____ ft. Casing Stickup

_____ MSL Ground Surface
 _____ ft. Top of annular sealant

_____ -1.5 ft. Top of Seal

_____ 4 ft. Total Seal Interval

_____ -6.5 ft. Top of Sand

_____ -8.5 ft. Top of Screen

_____ 10 ft. Total Screen Interval

_____ -18.5 ft. Bottom of Screen

_____ -19 ft. Bottom of Borehole

Completed by: J. DOLAN Surveyed by: K. TAHGHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Yakima Well #: MW-2
 Site Name: National Guard Township Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental, Inc. Date Drilled Start: 8/11/92
 Driller: J. DOLLAN Geologist: K. TAHGHIGHI Date Completed: 8/11/92
 Drilling Method: 4 5/8" 4 1/4" I.D. Drilling Fluids (type): _____

Annular Space Details

Type of Surface Seal: CEMENT
 Type of Annular Sealant: GRANULAR BENTONITE
 Amount of cement: # of bags _____ lbs. per bag _____
 Amount of bentonite: # of bags _____ lbs. per bag _____
 Type of Bentonite Seal (Granular, Pellet): Granular

Amount of bentonite: # of Bags 2 lbs. per bag 50
 Type of Sand Pack: 10-20 Silica Sand
 Source of Sand: COLORADO Silica Sand
 Amount of Sand: # of bags 1 3/4 lbs. per bag 100

Well Construction Materials

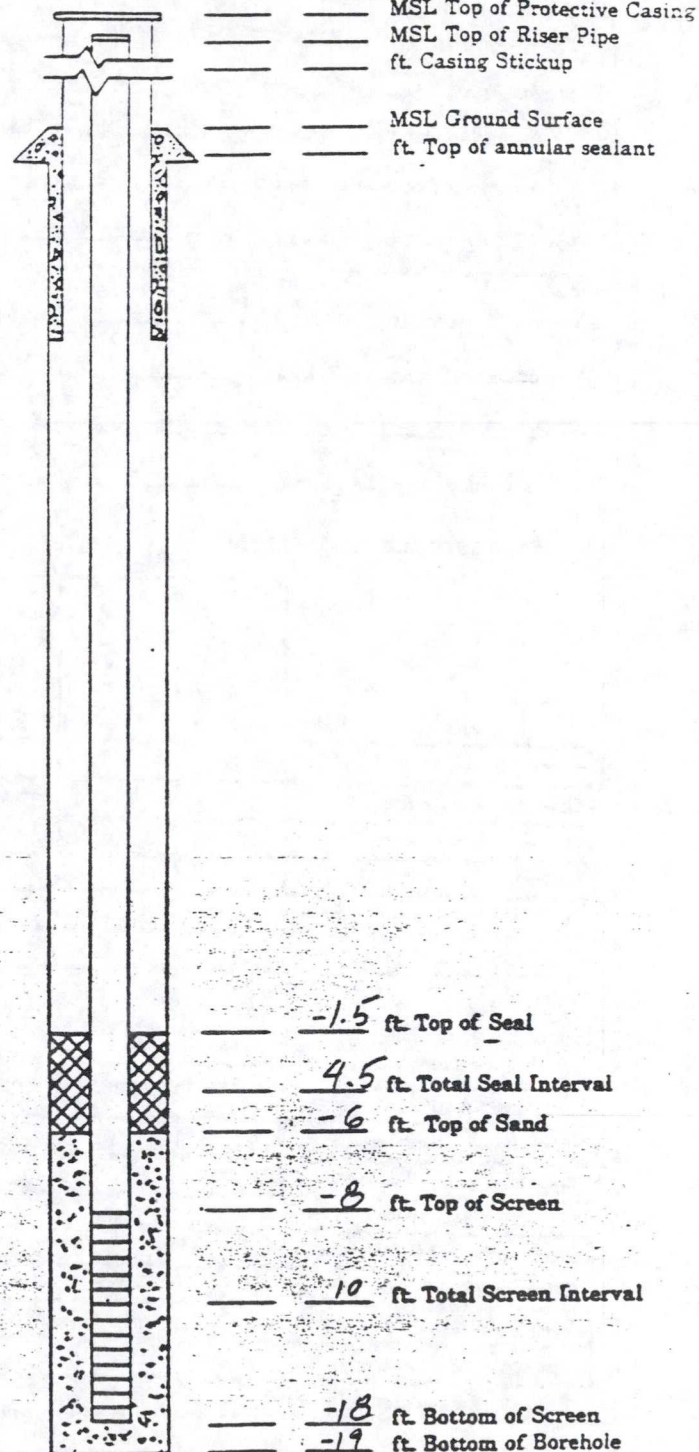
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			SC4 40	
Riser pipe below w.t.				
Screen			SC4 40	
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	8'
Protective casing length	1.5' (FLUSH MOUNT)
Screen length	10'
Bottom of screen to end cap	18'
Top of screen to first joint	
Total length of casing	
Screen slot size	0.010"
% of openings in screen	
Diameter of borehole (in)	8"
ID of riser pipe (in)	2"

Elevations - .01 ft.



Completed by: J. DOLLAN Surveyed by: K. TAHGHIGHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Yakima Well # MW-3
 Site Name: National Gear's Toppenish WA Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental, Inc. Date Drilled Start: 8/11/92
 Driller: J. Dolan Geologist: K. TAHGHIGHI Date Completed: 8/11/92
 Drilling Method: HSA 4 1/4" I.D. Drilling Fluids (type): _____

Annular Space Details

Type of Surface Seal: CEMENT
 Type of Annular Sealant: Granular Bentonite
 Amount of cement: # of bags _____ lbs. per bag _____
 Amount of bentonite: # of bags _____ lbs. per bag _____
 Type of Bentonite Seal (Granular, Pellet): Granular

Amount of bentonite: # of Bags 2 lbs. per bag 50

Type of Sand Pack: _____

Source of Sand: 10-20 Silica Sand

Amount of Sand: # of bags 1 3/4 lbs. per bag 100

Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			<u>SCH 40</u>	
Riser pipe below w.t.				
Screen			<u>SCH 40</u>	
Coupling joint screen to riser				
Protective casing				

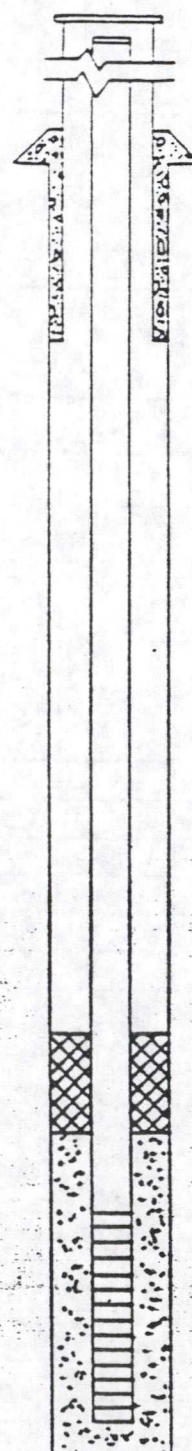
Measurements

to .01 ft. (where applicable)

Riser pipe length	<u>8'</u>
Protective casing length	<u>1.5' (FLUSH MOUNT)</u>
Screen length	<u>10' 10"</u>
Bottom of screen to end cap	<u>18'</u>
Top of screen to first joint	
Total length of casing	
Screen slot size	<u>0.010"</u>
% of openings in screen	
Diameter of borehole (in)	<u>8"</u>
ID of riser pipe (in)	<u>2"</u>

Elevations - .01 ft.

_____ MSL Top of Protective Casing
 _____ MSL Top of Riser Pipe
 _____ ft. Casing Stickup
 _____ MSL Ground Surface
 _____ ft. Top of annular sealant



_____ -1.5 ft. Top of Seal
 _____ 4.5 ft. Total Seal Interval
 _____ -6 ft. Top of Sand
 _____ -8 ft. Top of Screen
 _____ 10 ft. Total Screen Interval
 _____ -18 ft. Bottom of Screen
 _____ -18.5 ft. Bottom of Borehole

Completed by: J. Dolan Surveyed by: K. TAHGHIGHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Yakima Well #: MW-5
 Site Name: National Guard Trench #1 WA Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental Inc. Date Drilled Start: 8/12/92
 Driller: J. Dolan Geologist: K. TAHCHIGHI Date Completed: 8/12/92
 Drilling Method: HSA 4 1/4" I.D. Drilling Fluids (type): _____

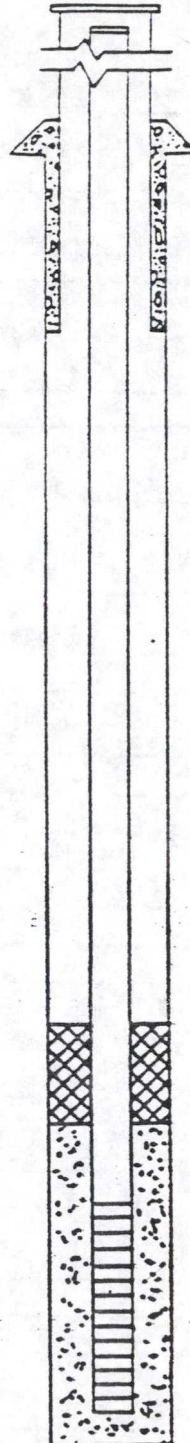
Annular Space Details

Type of Surface Seal: CEMENT
 Type of Annular Sealant: GRANULAR BENTONITE
 Amount of cement: # of bags _____ lbs. per bag _____
 Amount of bentonite: # of bags _____ lbs. per bag _____
 Type of Bentonite Seal (Granular, Pellet): GRANULAR

Amount of bentonite: # of Bags 2 lbs. per bag 50
 Type of Sand Pack: 10-20 Silica Sand
 Source of Sand: COLORADO
 Amount of Sand: # of bags 3 lbs. per bag 100

Elevations - .01 ft.

_____ MSL Top of Protective Casing
 _____ MSL Top of Riser Pipe
 _____ ft. Casing Stickup
 _____ MSL Ground Surface
 _____ ft. Top of annular sealant



_____ -1 ft. Top of Seal
 _____ -2 ft. Total Seal Interval
 _____ -5 ft. Top of Sand
 _____ -7 ft. Top of Screen
 _____ -10 ft. Total Screen Interval
 _____ -17 ft. Bottom of Screen
 _____ ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			SCH 40	
Riser pipe below w.t.			SCH 40	
Screen				
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	7'
Protective casing length	1' (FLUSH MOUNT)
Screen length	10'
Bottom of screen to end cap	17'
Top of screen to first joint	
Total length of casing	
Screen slot size	0.010"
% of openings in screen	
Diameter of borehole (in)	8"
ID of riser pipe (in)	2"

Completed by: J. DOLAN Surveyed by: K. TAHCHIGHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Polk Well #: M-1-4
 Site Name: NATIONAL GUARD TOPPENKA WA Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: BURLINGTON ENVIRONMENTAL INC Date Drilled Start: 8/12/92
 Driller: J. DOLLAN Geologist: K. TANGHIGHI Date Completed: 8/12/92
 Drilling Method: HSA 4 1/4" ID Drilling Fluids (type): _____

Annular Space Details

Type of Surface Seal: CEMENT
 Type of Annular Sealant: GRANULAR BENTONITE
 Amount of cement: # of bags _____ lbs. per bag _____
 Amount of bentonite: # of bags _____ lbs. per bag _____
 Type of Bentonite Seal (Granular, Pellet): GRANULAR

Amount of bentonite: # of Bags 3 lbs. per bag 50
 Type of Sand Pack: 10-20 SILICA SAND
 Source of Sand: COLORADO
 Amount of Sand: # of bags 2 1/2 lbs. per bag 100

Well Construction Materials

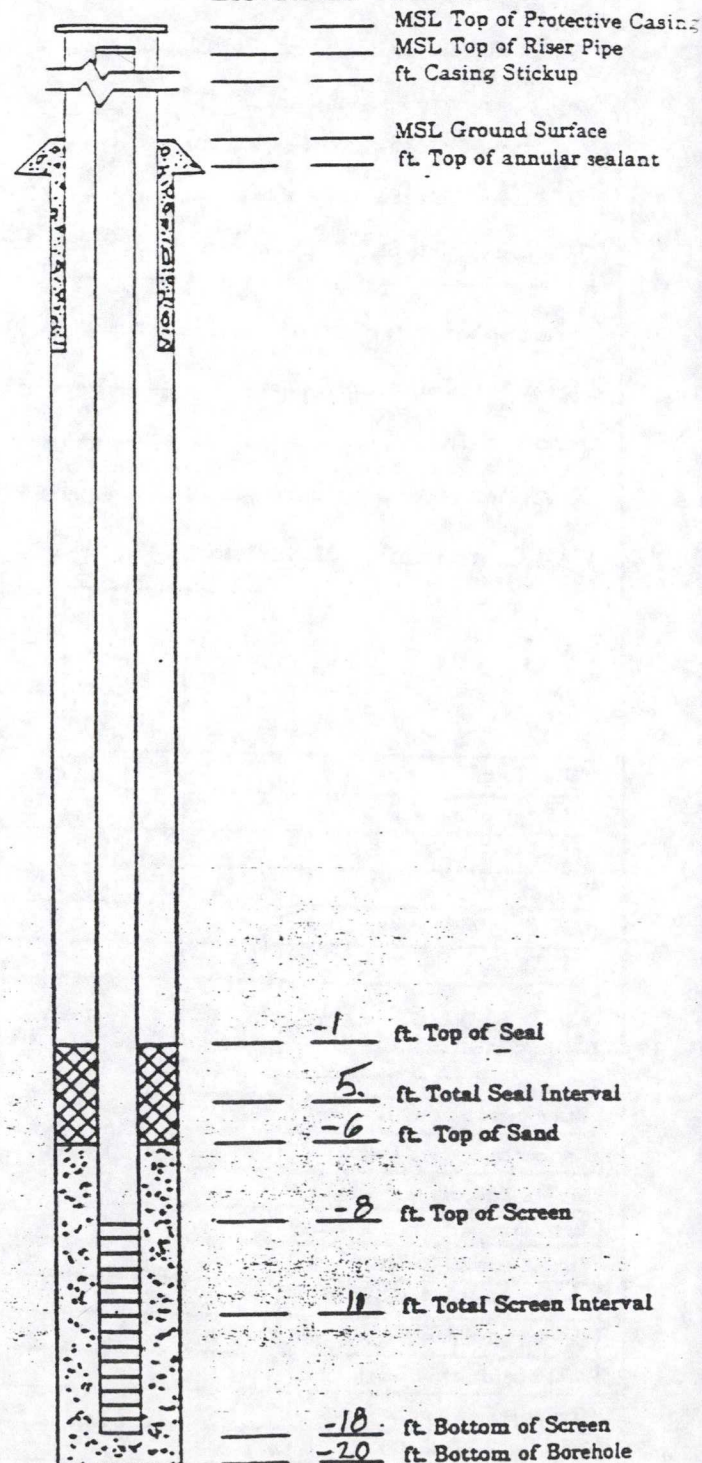
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			SCH 40	
Riser pipe below w.t.				
Screen			SCH 40	
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	8'
Protective casing length	1' (FLUSH MOUNT)
Screen length	10'
Bottom of screen to end cap	18'
Top of screen to first joint	
Total length of casing	
Screen slot size	0.01"
% of openings in screen	
Diameter of borehole (in)	8"
ID of riser pipe (in)	2"

Elevations - .01 ft.



Completed by: J. DOLLAN Surveyed by: K. TANGHIGHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Yakima Well #: MW-6
 Site Name: National Guard, Toppenish Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental, Inc. Date Drilled Start: 8/12/92
 Driller: J. DOLAN Geologist: K. TAGHICHI Date Completed: 8/12/92
 Drilling Method: HSA 4 1/4" I.D. Drilling Fluids (type): _____

Annular Space Details

Type of Surface Seal: CEMENT
 Type of Annular Sealant: GRANULAR BENTONITE
 Amount of cement: # of bags _____ lbs. per bag _____
 Amount of bentonite: # of bags _____ lbs. per bag _____
 Type of Bentonite Seal (Granular, Pellet): Granular

Amount of bentonite: # of Bags 2 1/2 lbs. per bag 50
 Type of Sand Pack: 10-20 Silica Sand
 Source of Sand: COLORADO Silica Sand
 Amount of Sand: # of bags 3 lbs. per bag 100

Well Construction Materials

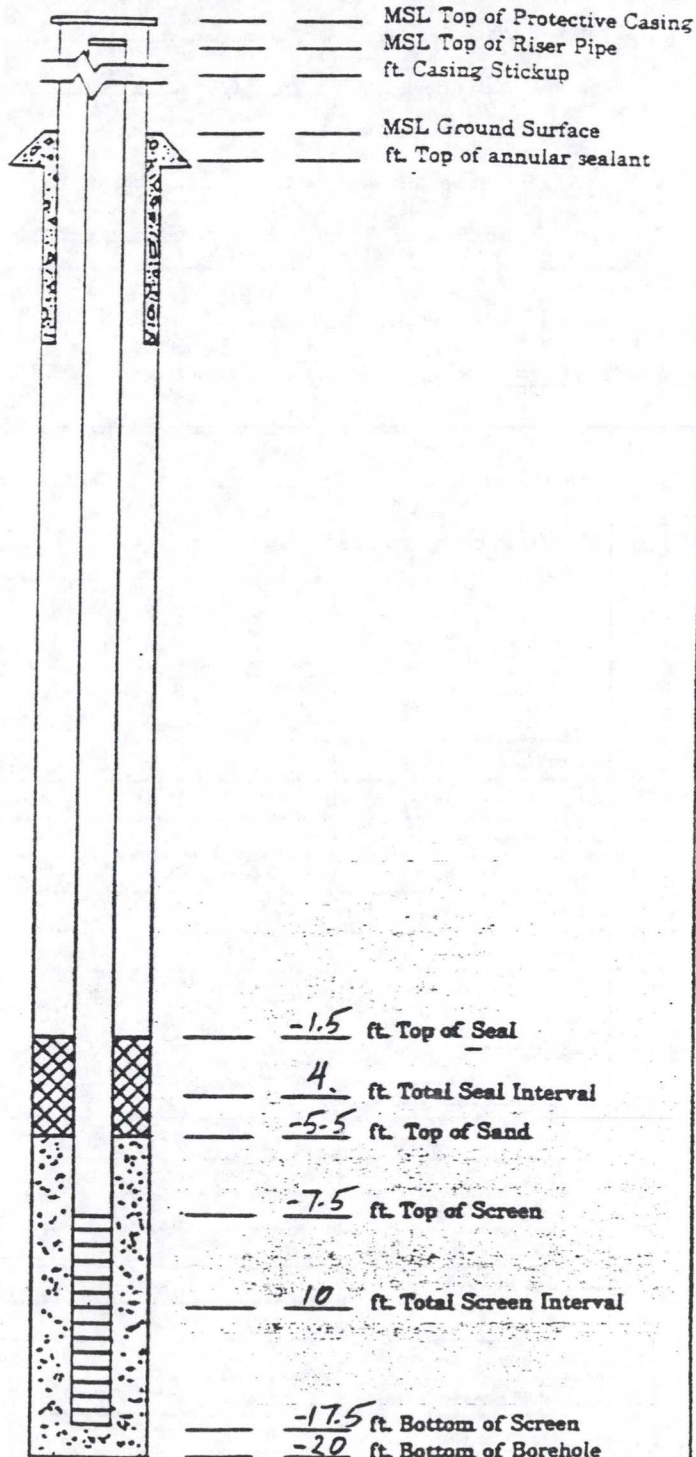
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			<u>SCH 40</u>	
Riser pipe below w.t.				
Screen			<u>SCH 40</u>	
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	<u>7.5'</u>
Protective casing length	<u>1.5' (FLUSH MOUNT)</u>
Screen length	<u>10'</u>
Bottom of screen to end cap	<u>17.5'</u>
Top of screen to first joint	
Total length of casing	
Screen slot size	<u>0.010"</u>
% of openings in screen	
Diameter of borehole (in)	<u>8"</u>
ID of riser pipe (in)	<u>2"</u>

Elevations - .01 ft.



Completed by: J. DOLAN Surveyed by: K. TAGHICHI Ill. registration # _____

Well Completion Report

Site #: 626121 County Yakima Well #: MW-7
 Site Name: National Guard Toppenish Grid Coordinate: Northing _____ Easting _____
 Drilling Contractor: Burlington Environmental, Inc. Date Drilled Start: 8/12/92
 Driller: J. DOLAN Geologist: K. TAUGHIGHI Date Completed: 3/12/92
 Drilling Method: HSA 4 1/4" I.D. Drilling Fluids (type): _____

Annular Space Details

Elevations - .01 ft.

Type of Surface Seal: CEMENTType of Annular Sealant: GRANULAR BENTONITE

Amount of cement: # of bags _____ lbs. per bag _____

Amount of bentonite: # of bags _____ lbs. per bag _____

Type of Bentonite Seal (Granular, Pellet): GRANULARAmount of bentonite: # of Bags 2 1/2 lbs. per bag 50Type of Sand Pack: 10-20 Silica SandSource of Sand: COLORADO Silica SandAmount of Sand: # of bags 3 lbs. per bag 100

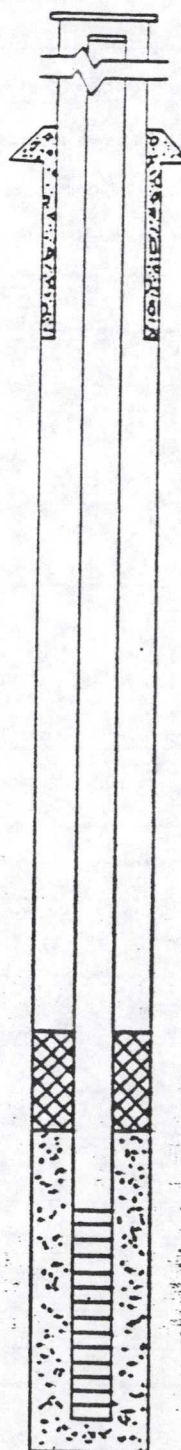
Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint				
Riser pipe above w.t.			<u>sch 40</u>	
Riser pipe below w.t.				
Screen			<u>sch 40</u>	
Coupling joint screen to riser				
Protective casing				

Measurements

to .01 ft. (where applicable)

Riser pipe length	<u>7.5'</u>
Protective casing length	<u>1' (FLUSH MOUNT)</u>
Screen length	<u>10'</u>
Bottom of screen to end cap	<u>17.5'</u>
Top of screen to first joint	
Total length of casing	
Screen slot size	<u>0.010"</u>
% of openings in screen	
Diameter of borehole (in)	<u>8"</u>
ID of riser pipe (in)	<u>2"</u>



_____ MSL Top of Protective Casing
 _____ MSL Top of Riser Pipe
 _____ ft. Casing Stickup

_____ MSL Ground Surface
 _____ ft. Top of annular sealant

_____ -1.0 ft. Top of Seal_____ 4.5 ft. Total Seal Interval_____ -5.5 ft. Top of Sand_____ -7.5 ft. Top of Screen_____ -10 ft. Total Screen Interval_____ -17.5 ft. Bottom of Screen_____ -20 ft. Bottom of Borehole

Completed by: J. DOLAN Surveyed by: K. TAUGHIGHI Ill. registration # _____

APPENDIX D

Laboratory Data

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental
Engineering

Date: August 24, 1992

Report On: Analysis of Water & Soil

Lab No: 26374

Page 1 of 9

IDENTIFICATION:

Samples received on 08-14-92

Project: 626121 National Guard Toppenish

ANALYSIS:

Lab No. 26374-1

Client ID: MW4-W1 (water)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/l

0.79

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

X9

Lab No. 26374-2

Client ID: MW5-W1 (water)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/l

1.0

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

X9

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 2 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-3

Client ID: MW6-W1 (water)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/l

0.62

(> C12 - C24)

SURROGATE RECOVERY, %
o-terphenyl

50

Lab No. 26374-4

Client ID: MW7-W1 (water)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/l

0.62

(> C12 - C24)

SURROGATE RECOVERY, %
o-terphenyl

78

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 3 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-5

Client ID: MW4-W2 (water)

BTEX by Method 8020
Date Analyzed: 8-21-92

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

SURROGATE RECOVERY, %

Trifluorotoluene	72
------------------	----

Lab No. 26374-6

Client ID: MW5-W2 (water)

BTEX by Method 8020
Date Analyzed: 8-21-92

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

SURROGATE RECOVERY, %

Trifluorotoluene	65
------------------	----

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 4 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-7

Client ID: MW6-W2 (water)

BTEX by Method 8020
Date Analyzed: 8-21-92

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

SURROGATE RECOVERY, %

Trifluorotoluene

74

Lab No. 26374-8

Client ID: MW7-W2 (water)

BTEX by Method 8020
Date Analyzed: 8-21-92

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

SURROGATE RECOVERY, %

Trifluorotoluene

76

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 5 of 9
Lab No. 26374
August 24, 1992

ICP Metals Per Method 6010
Date Digested: 8-18-92
Date Analyzed: 8-20-92

<u>Lab Sample No.</u>	<u>Client ID</u>	<u>Total Lead, mg/l</u>
9	MW4-W3 (water)	0.10
10	MW5-W3 (water)	0.29
11	MW6-W3 (water)	0.13

GFAA Metals Per 7000 Series Methods
Date Digested: 8-18-92
Date Analyzed: 8-20-92

<u>Lab Sample No.</u>	<u>Client ID</u>	<u>Total Lead, mg/l</u>
12	MW7-W3 (water)	0.012

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 7 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-15

Client ID: MW3-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

9,900

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

X8

Lab No. 26374-16

Client ID: MW4-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

26

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

64

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 6 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-13

Client ID: MW1-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

12

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

77

Lab No. 26374-14

Client ID: MW2-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

24

(> C12 - C24)

SURROGATE RECOVERY, %

o-terphenyl

50

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 8 of 9
Lab No. 26374
August 24, 1992

Lab No. 26374-17

Client ID: MW5-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

57

(> C12 - C24)

SURROGATE RECOVERY, %
o-terphenyl

74

Lab No. 26374-18

Client ID: MW6-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

15

(> C12 - C24)

SURROGATE RECOVERY, %
o-terphenyl

75

Lab No. 26374-19

Client ID: MW7-S1 (soil)

WTPH-D

Date Extracted: 8-18-92

Date Analyzed: 8-21-92

Diesel, mg/kg

29

(> C12 - C24)

SURROGATE RECOVERY, %
o-terphenyl

74

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Engineering
Project: 626121
Page 9 of 9
Lab No. 26374
August 24, 1992

ICP Metals Per Method 6010
Date Digested: 8-18-92
Date Analyzed: 8-20-92

<u>Lab Sample No.</u>	<u>Client ID</u>	<u>Total Lead, mg/kg</u>
20	MW1-S2 (soil)	11
21	MW2-S2 (soil)	9.2
22	MW3-S2 (soil)	7.4
23	MW4-S2 (soil)	8.7
24	MW5-S2 (soil)	9.0
25	MW6-S2 (soil)	7.9
26	MW7-S2 (soil)	8.7

GFAA Metals Per 7000 Series Methods
Date Digested: 8-18-92
Date Analyzed: 8-20-92

<u>Lab Sample No.</u>	<u>Client ID</u>	<u>Dissolved Lead, mg/l</u>
27	MW4-W4 (water)	< 0.005
28	MW5-W4 (water)	< 0.005
29	MW6-W4 (water)	< 0.005
30	MW7-W4 (water)	< 0.005

SOUND ANALYTICAL SERVICES


MARTY FRENCH

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

BTEX by EPA SW-846 Method 8020

Client: Burlington Environmental - Engineering
Lab No: 26374qcl
Matrix: Water
Units: mg/l
Date: August 24, 1992

METHOD BLANK

Parameter	Blank Value
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001
<u>SURROGATE RECOVERY, %</u> Trifluorotoluene	87

DUPLICATE

Dup No. 26374-5

Parameter	Sample (S)	Duplicate (D)	RPD
Benzene	< 0.001	< 0.001	0.0
Toluene	< 0.001	< 0.001	0.0
Ethyl Benzene	< 0.001	< 0.001	0.0
Xylenes	< 0.001	< 0.001	0.0
<u>SURROGATE RECOVERY, %</u> Trifluorotoluene	72	74	

RPD = Relative Percent Difference
= $[(S - D) / ((S + D) / 2)] \times 100$

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-D (Diesel Range Organics)

Client: Burlington Environmental
Lab No: 26374qc2
Matrix: Soil
Units: mg/kg
Date: August 24, 1992

DUPLICATE

Dup No. 26374-19

Parameter	Sample (S)	Duplicate (D)	RPD
Diesel ($>C_{12}-C_{24}$)	29	26	11.0
<u>SURROGATE RECOVERY, %</u> o-terphenyl	74	75	

RPD = Relative Percent Difference
= $[(S - D) / ((S + D) / 2)] \times 100$

METHOD BLANK

Parameter	Blank Value
Diesel	< 25
<u>SURROGATE RECOVERY, %</u> o-terphenyl	74

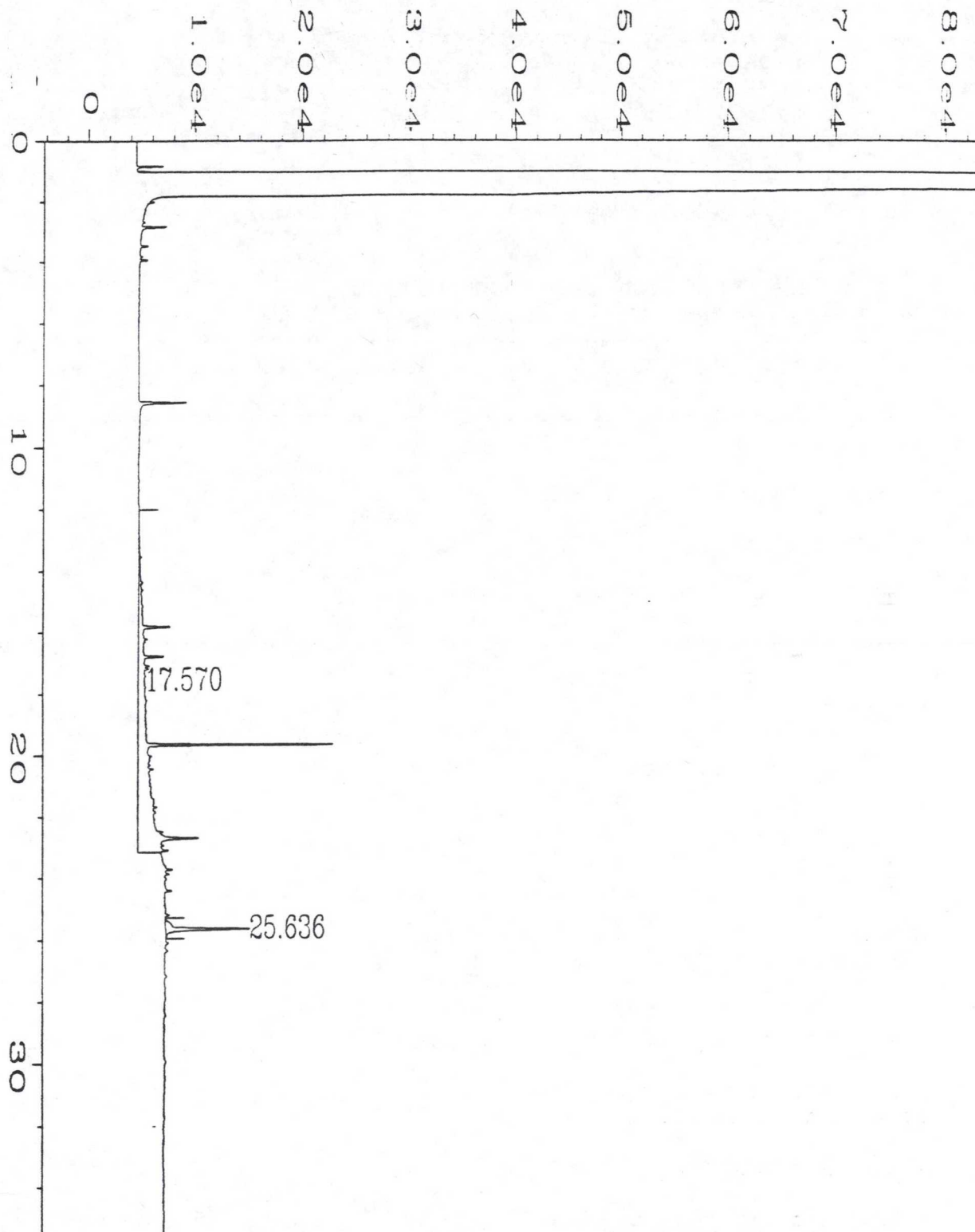
SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

- ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- C: The identification of this analyte was confirmed by GC/MS.
- B: This analyte was also detected in the associated method blank. There is a possibility of blank contamination.
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- A: This TIC is a suspected aldol-condensation product.
- M: Quantitation Limits are elevated due to matrix interferences.
- S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.
- X10: Surrogate recovery outside QC limits due to high contaminant levels.



Data File Name	: C:\HPCHEM\1\DATA\082092_A\025F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 25
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-1	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 12:50 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	24 Aug 92 12:01 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	: 0
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\025F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-1
Run Time Bar Code:
Acquired on     : 21 Aug 92  12:50 PM
Report Created on: 24 Aug 92  12:02 PM
Last Recalib on : 24 AUG 92  09:09 AM
Multiplier     : 1
Page Number     : 1
Vial Number     : 25
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\025F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	567628	PH +	0.000	1	49.827	wd hcid diesel

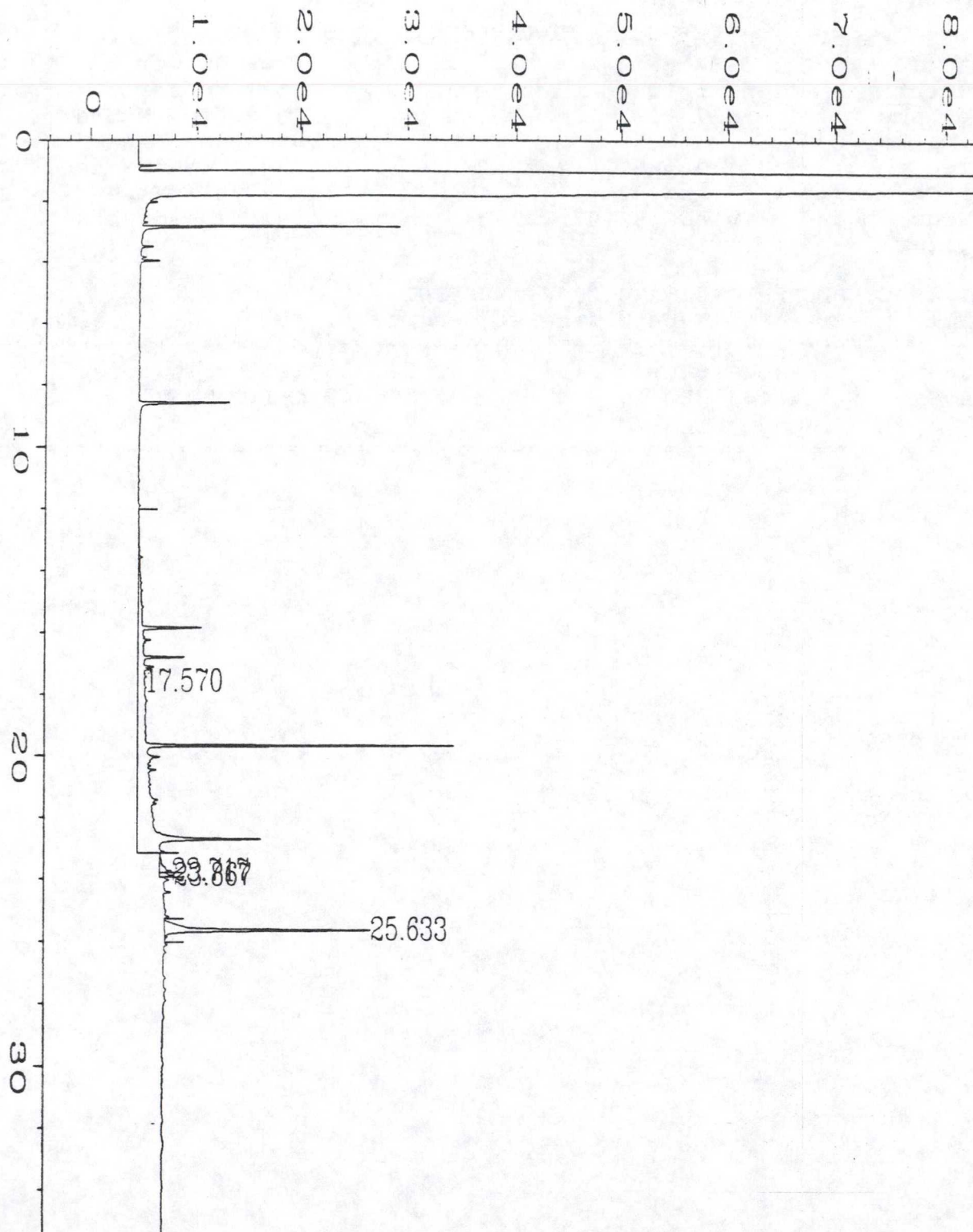
External Standard Report

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Data File Name   : C:\HPCHEM\1\DATA\082092_A\025F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-1
Run Time Bar Code:
Acquired on     : 21 Aug 92  12:50 PM
Report Created on: 22 Aug 92  11:28 AM
Last Recalib on : 19 AUG 92  07:22 AM
Multiplier      : 1
Page Number     : 1
Vial Number     : 25
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\025F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.568	14049	BB	0.049	1	24.326	1-Cloctane
19.658	41403	BB	0.036	1	19.645	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\026F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 26
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-2	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: O-TERPH.MTH
Acquired on	: 21 Aug 92 01:32 PM	Analysis Method	: HP5890-1.MTH
Report Created on	: 24 Aug 92 12:03 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\026F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-2
Run Time Bar Code:
Acquired on     : 21 Aug 92  01:32 PM
Report Created on: 24 Aug 92  12:03 PM
Last Recalib on : 24 AUG 92  09:09 AM
Multiplier      : 1

Page Number     : 1
Vial Number     : 26
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\026F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	664519	PH +	0.000	1	63.179	wd hcid diesel

External Standard Report

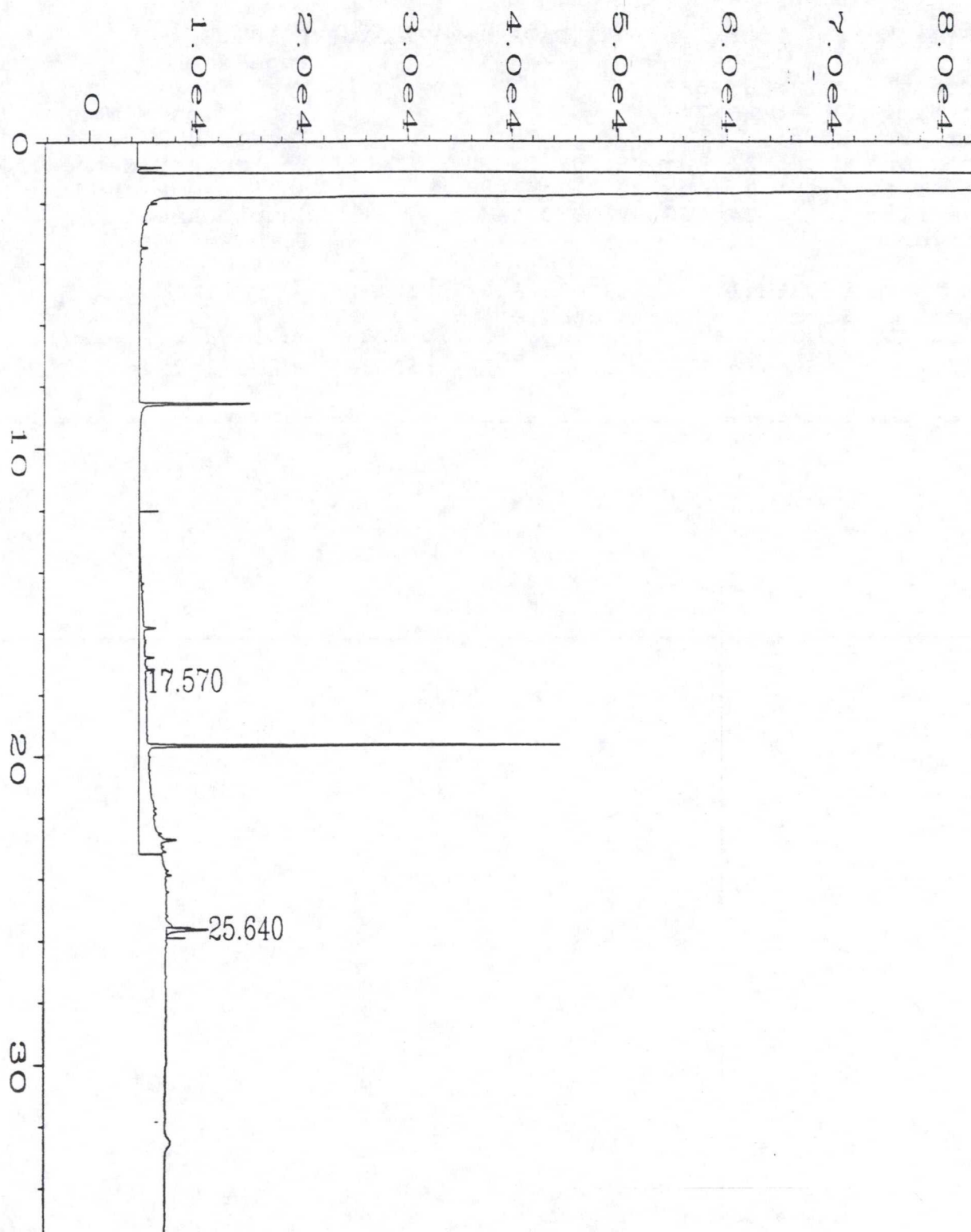
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Data File Name   : C:\HPCHEM\1\DATA\082092_A\026F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-2
Run Time Bar Code:
Acquired on    : 21 Aug 92  01:32 PM
Report Created on: 22 Aug 92  11:28 AM
Last Recalib on : 19 AUG 92  07:22 AM
Multiplier     : 1

Page Number     : 1
Vial Number     : 26
Injection Number : 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\026F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.565	25810	BB	0.047	1	34.340	1-Cloctane
19.655	74936	BB	0.039	1	36.949	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\027F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 27
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-3	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 02:15 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	24 Aug 92 12:04 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\027F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 27
 Sample Name : 26374-3 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 02:15 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 12:04 PM Analysis Method : HP5890-1.MTH
 Last Recalib on : 24 AUG 92 09:09 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\027F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	596929	PH +	0.000	1	53.865	wd hcid diesel

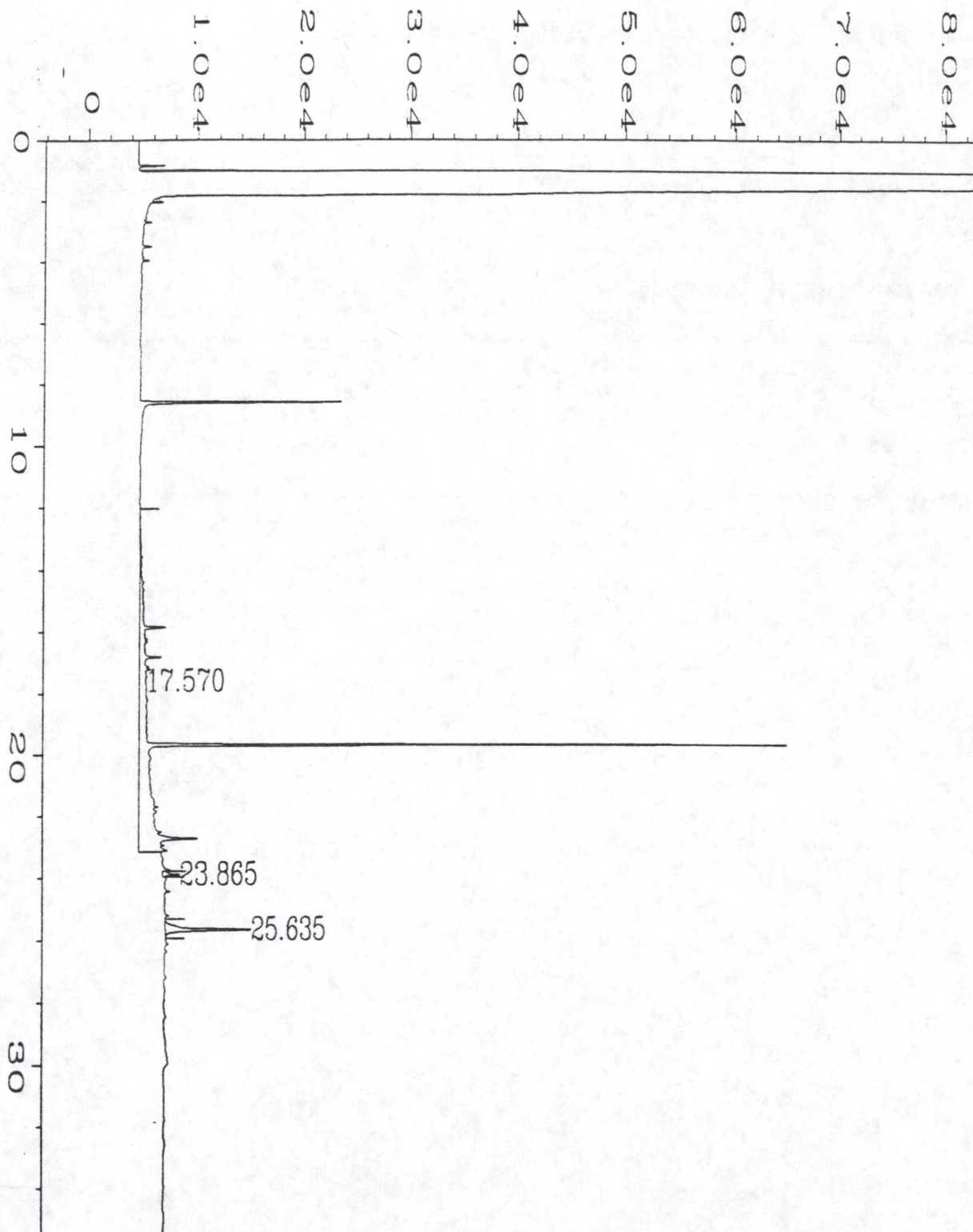
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\027F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 27
 Sample Name : 26374-3 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 02:15 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 01:50 PM Analysis Method : O-TERPH.MTH
 Last Recalib on : 19 AUG 92 07:22 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\027F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.566	31929	BB	0.048	1	39.550	1-Cloctane
19.654	100565	MM	0.042	1	50.174	o-Terphenyl

User Modified



Data File Name	: C:\HPCHEM\1\DATA\082092_A\028F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 28
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-4	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: O-TERPH.MTH
Acquired on	: 21 Aug 92 02:59 PM	Analysis Method	: HP5890-1.MTH
Report Created on	: 24 Aug 92 12:05 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\028F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-4
Run Time Bar Code:
Acquired on    : 21 Aug 92 02:59 PM
Report Created on: 24 Aug 92 12:05 PM
Last Recalib on : 24 AUG 92 09:09 AM
Multiplier     : 1
Page Number    : 1
Vial Number    : 28
Injection Number : 1
Sequence Line  : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount   : 0
ISTD Amount     :
  
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Sig. 1 in C:\HPCHEM\1\DATA\082092_A\028F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	655251	PH +	0.000	1	61.902	wd hcid diesel

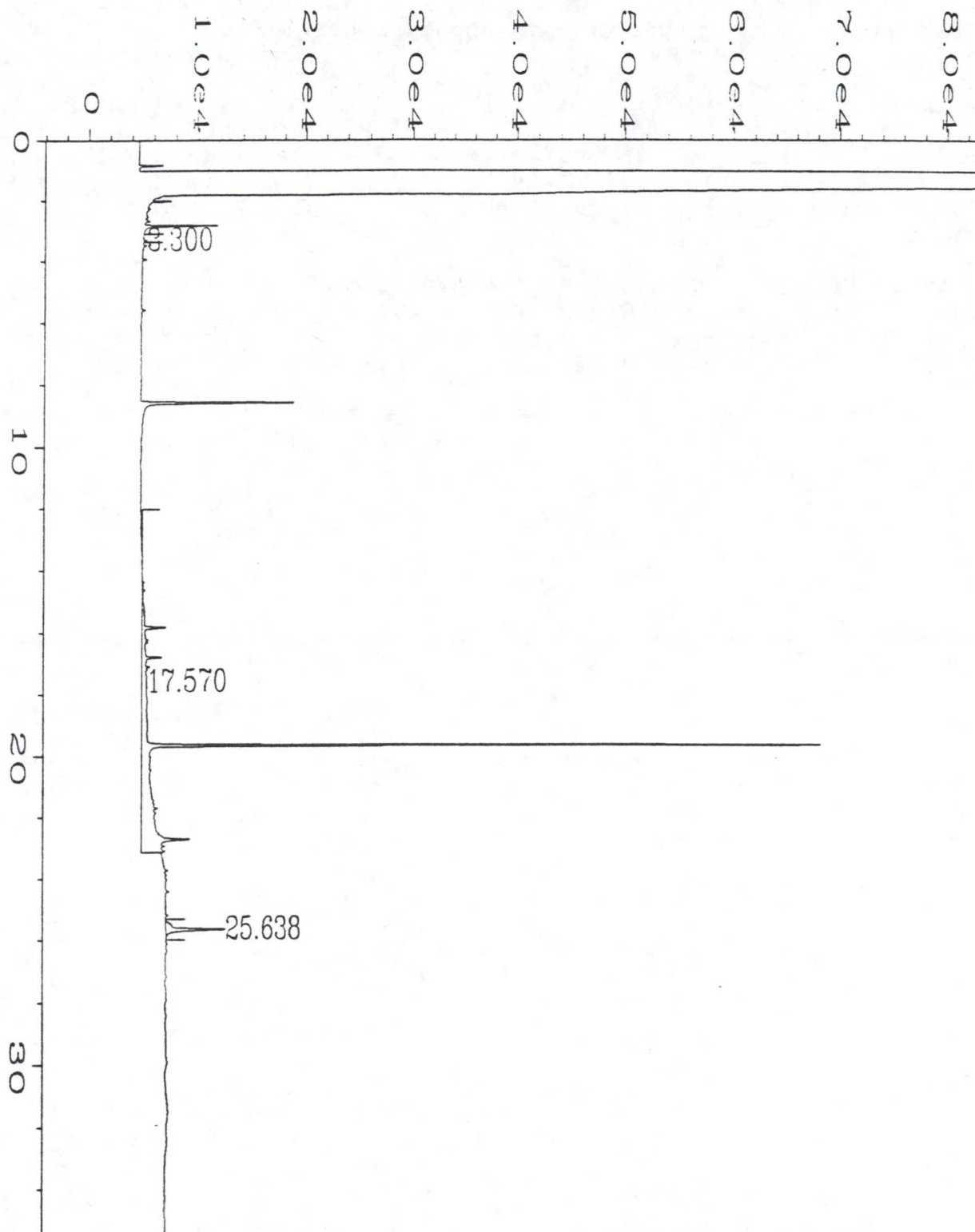
External Standard Report

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Data File Name   : C:\HPCHEM\1\DATA\082092_A\028F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-4
Run Time Bar Code:
Acquired on    : 21 Aug 92  02:59 PM
Report Created on: 22 Aug 92  11:40 AM
Last Recalib on : 19 AUG 92  07:22 AM
Multiplier     : 1
Page Number    : 1
Vial Number    : 28
Injection Number : 1
Sequence Line  : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount  : 0
ISTD Amount    :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\028F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.562	56003	BB	0.045	1	60.046	1-Cloctane
19.653	155004	BB	0.039	1	78.265	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\029F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 29
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-13	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: O-TERPH.MTH
Acquired on	: 21 Aug 92 03:43 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	: 24 Aug 92 12:06 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\029F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-13
Run Time Bar Code:
Acquired on    : 21 Aug 92  03:43 PM
Report Created on: 24 Aug 92  12:06 PM
Last Recalib on : 24 AUG 92  09:09 AM
Multiplier     : 1

Page Number     : 1
Vial Number     : 29
Injection Number : 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\029F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	510838	PH +	0.000	1	42.000	wd hcid diesel

External Standard Report

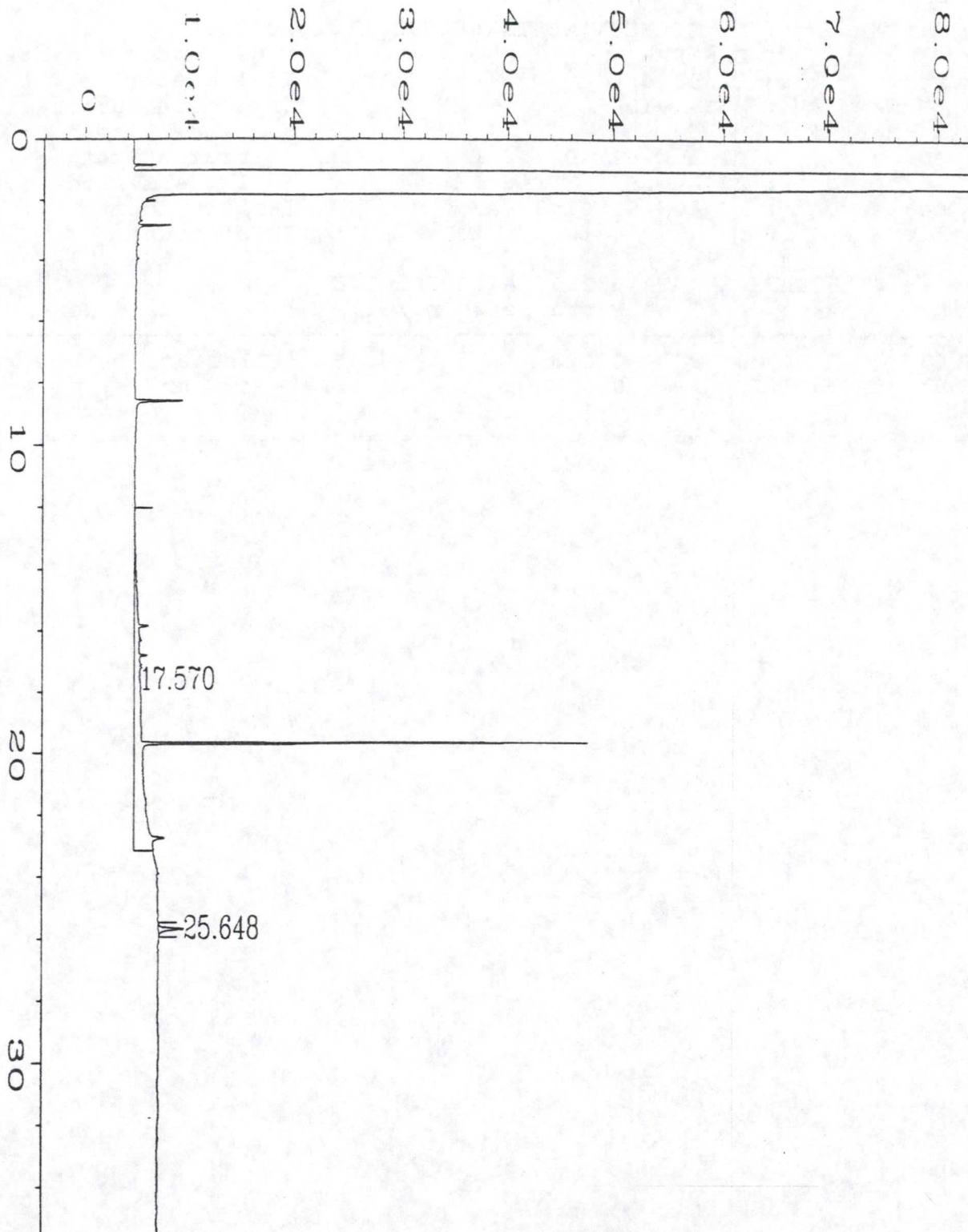
```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\029F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-13
Run Time Bar Code:
Acquired on    : 21 Aug 92  03:43 PM
Report Created on: 22 Aug 92  11:40 AM
Last Recalib on : 19 AUG 92  07:22 AM
Multiplier     : 1

Page Number     : 1
Vial Number     : 29
Injection Number : 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\029F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.563	43831	BB	0.048	1	49.684	1-Cloctane
19.654	152770	BB	0.037	1	77.112	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\030F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 30
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-14	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 04:26 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	24 Aug 92 12:07 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\030F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 30
 Sample Name : 26374-14 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 04:26 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 12:08 PM Analysis Method : HP5890-1.MTH
 Last Recalib on : 24 AUG 92 09:09 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\030F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	529465	PH + 0.000	1	44.567	wd hcid diesel	

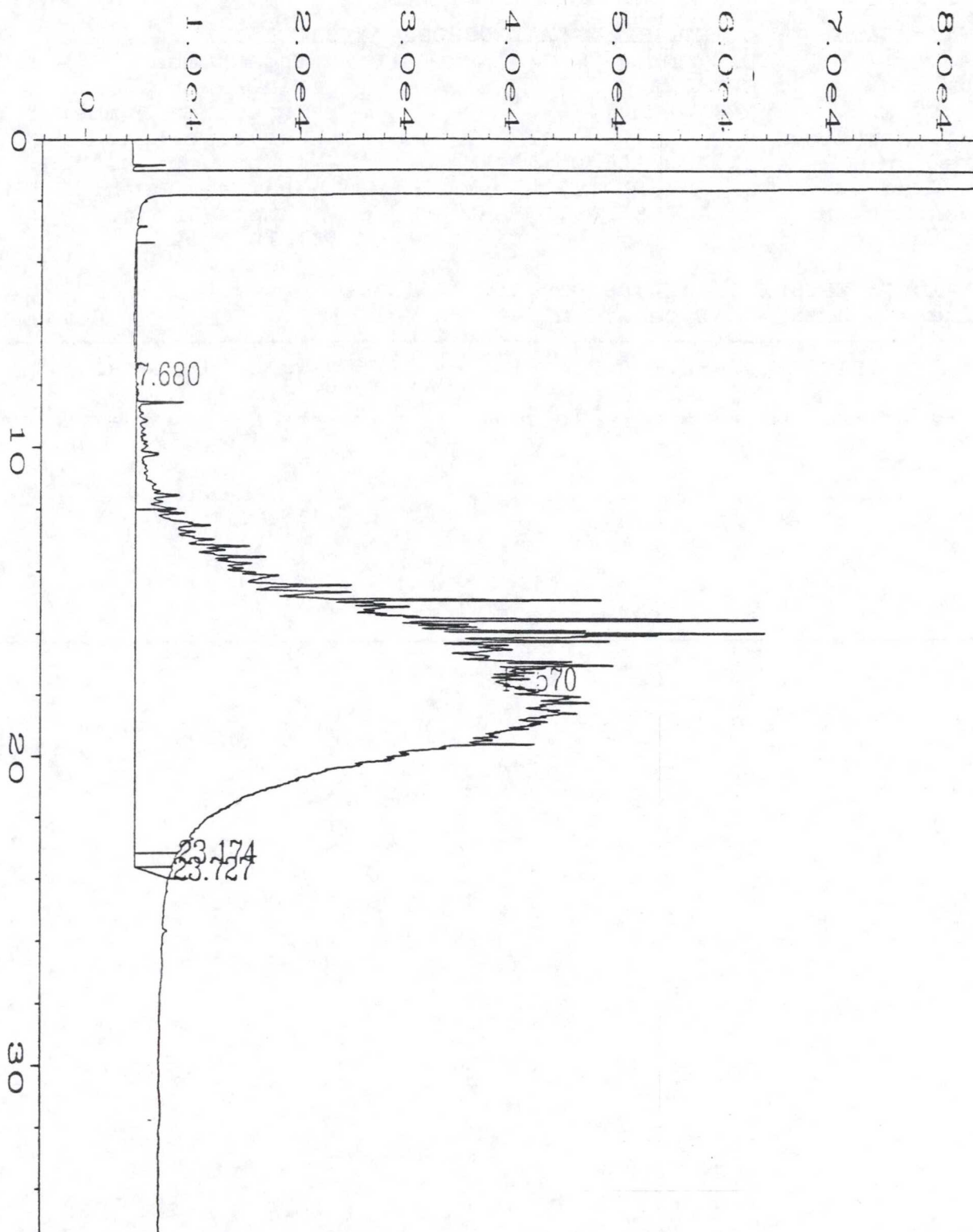
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\030F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 30
 Sample Name : 26374-14 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 04:26 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 02:14 PM Analysis Method : O-TERPH.MTH
 Last Recalib on : 19 AUG 92 07:22 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\030F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.564	14739	BB	0.049	1	24.915	1-Cloctane
19.654	99534	MM	0.039	1	49.641	o-Terphenyl

User Modified



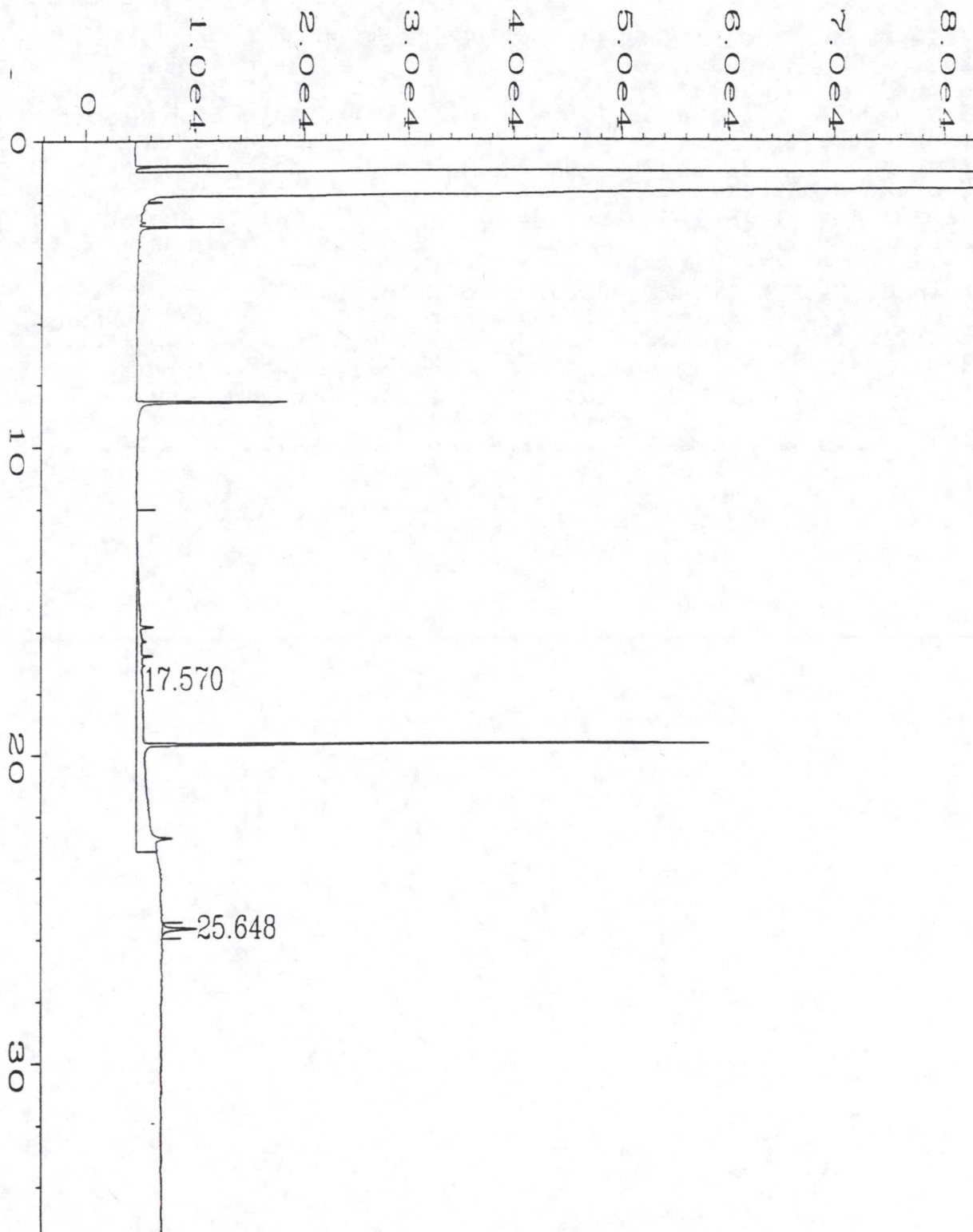
Data File Name	: C:\HPCHEM\1\DATA\082092_A\031F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 31
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-15 1:5	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 05:10 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	24 Aug 92 12:08 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\031F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 31
 Sample Name : 26374-15 1:5 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 05:10 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 12:09 PM Analysis Method : HP5890-1.MTH
 Last Recalib on : 24 AUG 92 09:09 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\031F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	1.39107E+007	HH + 0.000	1	1888.654	wd hcid diesel	



Data File Name	: C:\HPCHEM\1\DATA\082092_A\032F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 32
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-16	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: O-TERPH.MTH
Acquired on	: 21 Aug 92 05:54 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	: 24 Aug 92 12:09 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\031F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-15 1:5
Run Time Bar Code:
Acquired on     : 21 Aug 92 05:10 PM
Report Created on: 22 Aug 92 11:41 AM
Last Recalib on : 19 AUG 92 07:22 AM
Multiplier      : 1

Page Number     : 1
Vial Number     : 31
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\031F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.562	11577	BB	0.045	1	22.222	1-Cloctane
19.654	29621	VV	0.045	1	13.565	o-Terphenyl

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\082092_A\032F0101.D
 Operator : DAS/DMW Page Number : 1
 Instrument : HP 5890 Vial Number : 32
 Sample Name : 26374-16 Injection Number : 1
 Run Time Bar Code: Sequence Line : 1
 Acquired on : 21 Aug 92 05:54 PM Instrument Method: O-TERPH.MTH
 Report Created on: 24 Aug 92 12:10 PM Analysis Method : HP5890-1.MTH
 Last Recalib on : 24 AUG 92 09:09 AM Sample Amount : 0
 Multiplier : 1 ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\032F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	563513	PH +	0.000	1	49.260	wd hcid diesel

External Standard Report

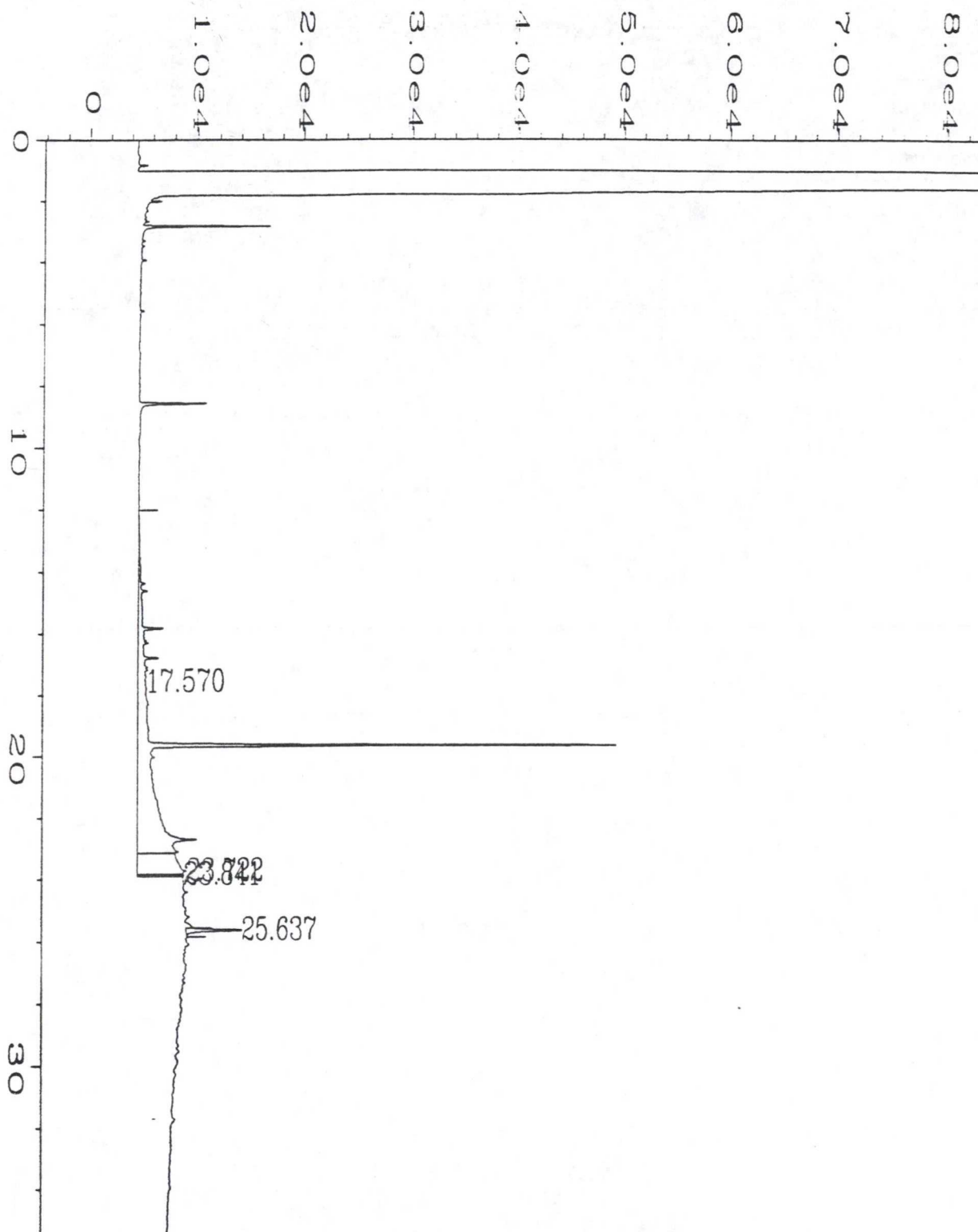
```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\032F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-16
Run Time Bar Code:
Acquired on     : 21 Aug 92  05:54 PM
Report Created on: 22 Aug 92  11:41 AM
Last Recalib on : 19 AUG 92  07:22 AM
Multiplier     : 1

Page Number     : 1
Vial Number     : 32
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\032F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.563	43391	BB	0.049	1	49.308	1-Cloctane
19.656	126817	BB	0.037	1	63.720	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\033F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 33
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-17	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 06:37 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	24 Aug 92 12:11 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\033F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-17
Run Time Bar Code:
Acquired on     : 21 Aug 92 06:37 PM
Report Created on: 24 Aug 92 12:11 PM
Last Recalib on : 24 AUG 92 09:09 AM
Multiplier     : 1
Page Number     : 1
Vial Number     : 33
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\033F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	819787	PH +	0.000	1	84.577	wd hcid diesel

External Standard Report

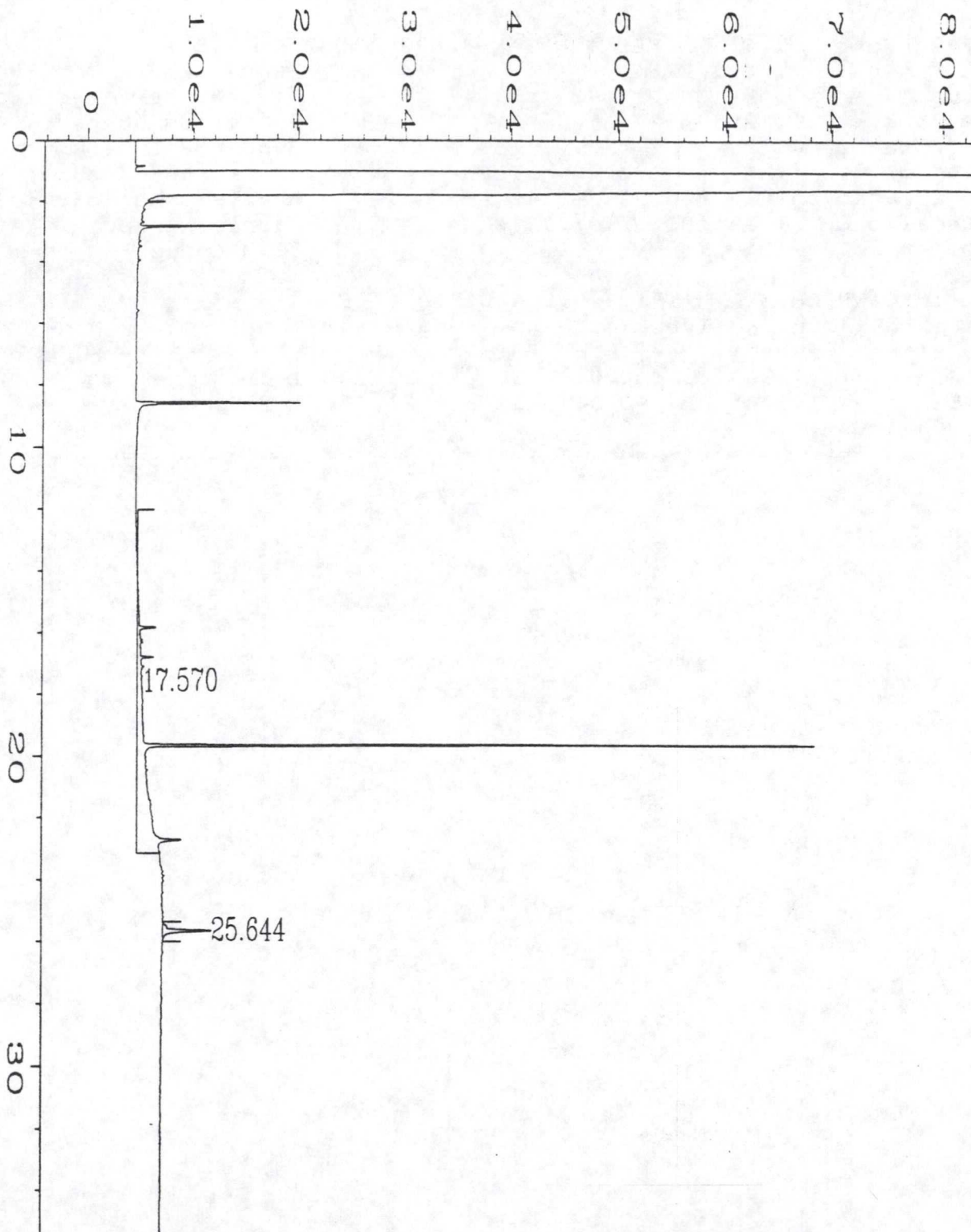
```

Data File Name      : C:\HPCHEM\1\DATA\082092_A\033F0101.D
Operator           : DAS/DMW
Instrument          : HP 5890
Sample Name        : 26374-17
Run Time Bar Code  :
Acquired on        : 21 Aug 92  06:37 PM
Report Created on   : 22 Aug 92  11:42 AM
Last Recalib on    : 19 AUG 92  07:22 AM
Multiplier         : 1

Page Number        : 1
Vial Number        : 33
Injection Number    : 1
Sequence Line      : 1
Instrument Method   : O-TERPH.MTH
Analysis Method     : O-TERPH.MTH
Sample Amount       : 0
ISTD Amount         :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\033F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.567	18809	BB	0.048	1	28.380	1-Cloctane
19.656	147465	BB	0.048	1	74.375	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\034F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 34
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-18	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 07:21 PM	Analysis Method:	HP5890-1.MTH
Report Created on:	24 Aug 92 12:12 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name      : C:\HPCHEM\1\DATA\082092_A\034F0101.D
Operator            : DAS/DMW
Instrument           : HP 5890
Sample Name         : 26374-18
Run Time Bar Code   :
Acquired on         : 21 Aug 92  07:21 PM
Report Created on    : 24 Aug 92  12:12 PM
Last Recalib on     : 24 AUG 92  09:09 AM
Multiplier          : 1
Page Number         : 1
Vial Number         : 34
Injection Number    : 1
Sequence Line       : 1
Instrument Method    : O-TERPH.MTH
Analysis Method     : HP5890-1.MTH
Sample Amount       : 0
ISTD Amount         :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\034F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	534668	PH +	0.000	1	45.284	wd hcid diesel

External Standard Report

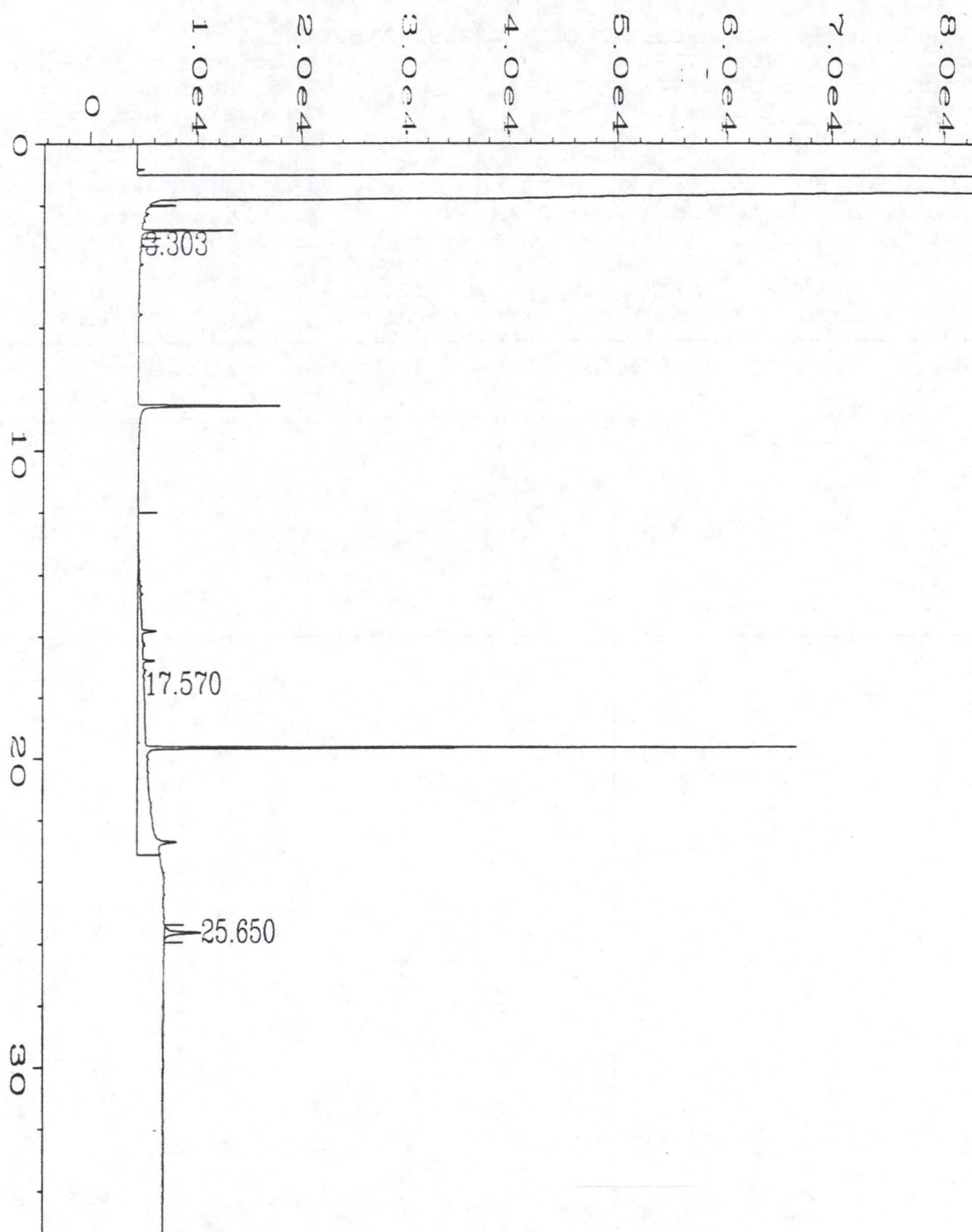
```

Data File Name      : C:\HPCHEM\1\DATA\082092_A\034F0101.D
Operator            : DAS/DMW
Instrument           : HP 5890
Sample Name         : 26374-18
Run Time Bar Code   :
Acquired on         : 21 Aug 92  07:21 PM
Report Created on   : 22 Aug 92  11:42 AM
Last Recalib on    : 19 AUG 92  07:22 AM
Multiplier          : 1

Page Number         : 1
Vial Number         : 34
Injection Number    : 1
Sequence Line       : 1
Instrument Method    : O-TERPH.MTH
Analysis Method     : O-TERPH.MTH
Sample Amount       : 0
ISTD Amount         :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\034F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.570	48379	BB	0.047	1	53.555	1-Cloctane
19.658	149074	BB	0.036	1	75.205	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\035F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 35
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-19	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	O-TERPH.MTH
Acquired on	: 21 Aug 92 08:04 PM	Analysis Method:	HP5890-1.MTH
Report Created on:	24 Aug 92 12:13 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\035F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-19
Run Time Bar Code:
Acquired on    : 21 Aug 92  08:04 PM
Report Created on: 24 Aug 92  12:13 PM
Last Recalib on : 24 AUG 92  09:09 AM
Multiplier     : 1
Page Number    : 1
Vial Number    : 35
Injection Number : 1
Sequence Line  : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount  : 0
ISTD Amount    :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\035F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	610831	PH +	0.000	1	55.781	wd hcid diesel

External Standard Report

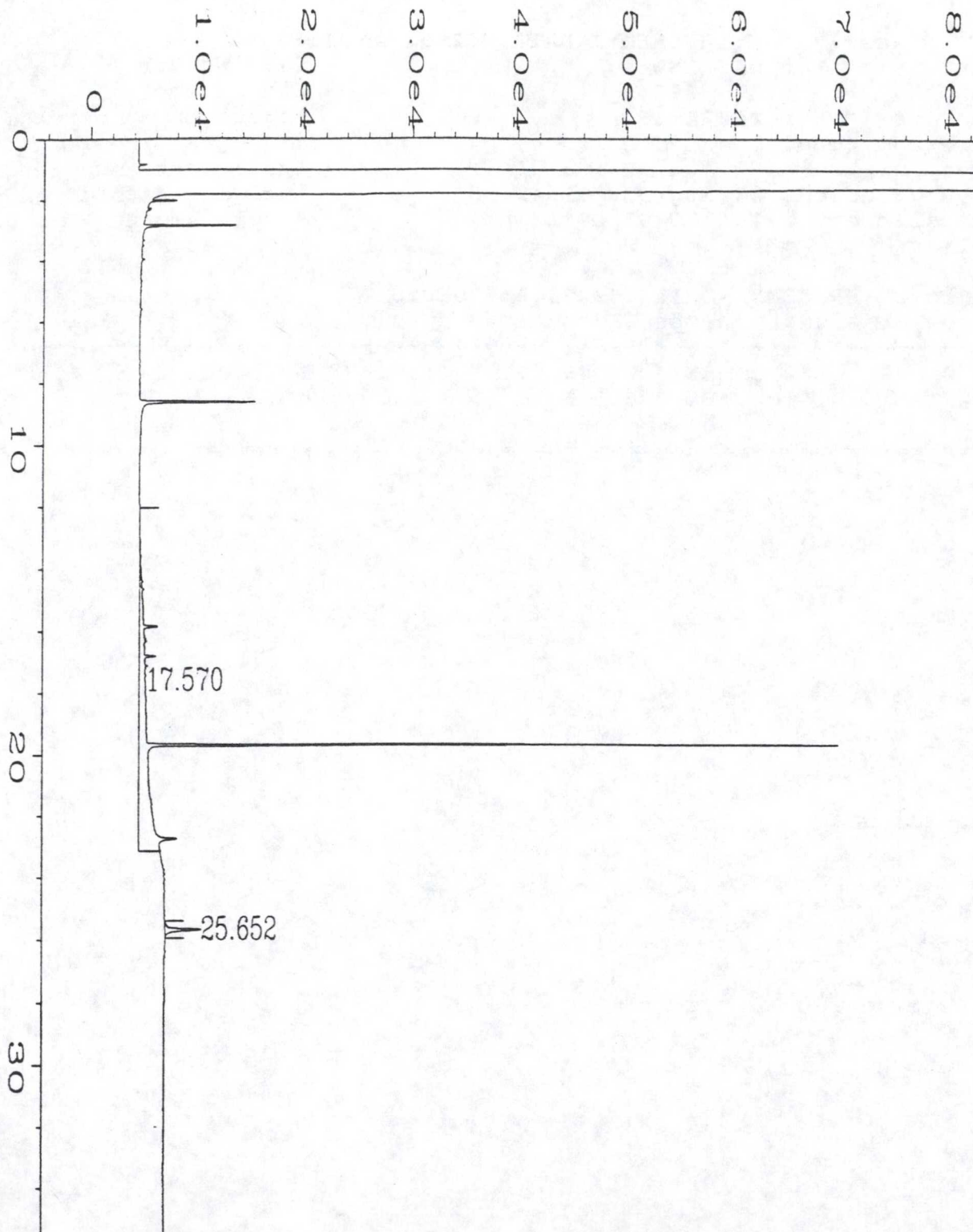
```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\035F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-19
Run Time Bar Code:
Acquired on     : 21 Aug 92 08:04 PM
Report Created on: 22 Aug 92 11:42 AM
Last Recalib on : 19 AUG 92 07:22 AM
Multiplier      : 1

Page Number     : 1
Vial Number     : 35
Injection Number: 1
Sequence Line   : 1
Instrument Method: O-TERPH.MTH
Analysis Method : O-TERPH.MTH
Sample Amount   : 0
ISTD Amount     :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\035F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.570	42239	BB	0.048	1	48.328	1-Cloctane
19.659	146022	BB	0.036	1	73.630	o-Terphenyl



Data File Name	: C:\HPCHEM\1\DATA\082092_A\036F0101.D	Page Number	: 1
Operator	: DAS/DMW	Vial Number	: 36
Instrument	: HP 5890	Injection Number	: 1
Sample Name	: 26374-19D	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: O-TERPH.MTH
Acquired on	: 21 Aug 92 08:47 PM	Analysis Method	: HP5890-1.MTH
Report Created on:	: 24 Aug 92 12:14 PM	Sample Amount	: 0
Last Recalib on	: 24 AUG 92 09:09 AM	ISTD Amount	:
Multiplier	: 1		

External Standard Report

```

Data File Name   : C:\HPCHEM\1\DATA\082092_A\036F0101.D
Operator        : DAS/DMW
Instrument       : HP 5890
Sample Name     : 26374-19D
Run Time Bar Code:
Acquired on    : 21 Aug 92  08:47 PM
Report Created on: 24 Aug 92  12:14 PM
Last Recalib on : 24 AUG 92  09:09 AM
Multiplier     : 1
Page Number    : 1
Vial Number    : 36
Injection Number : 1
Sequence Line  : 1
Instrument Method: O-TERPH.MTH
Analysis Method : HP5890-1.MTH
Sample Amount  : 0
ISTD Amount    :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\036F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
17.570	594989	PH +	0.000	1	53.597	wd hcid diesel

External Standard Report

```

Data File Name      : C:\HPCHEM\1\DATA\082092_A\036F0101.D
Operator           : DAS/DMW
Instrument          : HP 5890
Sample Name        : 26374-19D
Run Time Bar Code  :
Acquired on        : 21 Aug 92 08:47 PM
Report Created on   : 22 Aug 92 11:43 AM
Last Recalib on    : 19 AUG 92 07:22 AM
Multiplier         : 1

Page Number        : 1
Vial Number        : 36
Injection Number   : 1
Sequence Line      : 1
Instrument Method   : O-TERPH.MTH
Analysis Method    : O-TERPH.MTH
Sample Amount      : 0
ISTD Amount        :
  
```

Sig. 1 in C:\HPCHEM\1\DATA\082092_A\036F0101.D

Ret Time	Area	Type	Width	Ref#	ng/ul	Name
8.576	33922	BB	0.048	1	41.247	1-Cloctane
19.660	149014	BB	0.036	1	75.174	o-Terphenyl

APPENDIX E

Analytical Data Review

MEMORANDUM

DATE: September 10, 1992

TO: Chip Goodhue, Hydrogeologist - Technical Services

FROM: Neils Cone, Chemist - Technical Services

SUBJECT: DATA VALIDATION OF TOPPENISH NATIONAL GUARD PROJECT NO. 626121

On August 11, 12, and 13, 1992, water and soil samples were collected by Burlington Environmental personnel and submitted for analysis on August 14, 1992, to Sound Analytical Services. An analytical data review was performed on the following samples:

MW1-S1	MW1-S2	MW4-W1	MW4-W3
MW2-S1	MW2-S2	MW5-W1	MW5-W3
MW3-S1	MW3-S2	MW6-W1	MW6-W3
MW4-S1	MW4-S2	MW7-W1	MW7-W3
MW5-S1	MW5-S2	MW4-W2	MW4-W4
MW6-S1	MW6-S2	MW5-W2	MW5-W4
MW7-S1	MW7-S2	MW6-W2	MW6-W4
		MW7-W2	MW7-W4

Accurate chain-of-custody reports were included along with documented signatures from the field to laboratory receipt. All samples were shown as having been properly iced and received in good condition. Proper field sample control reports were included along with clearly written sampling methods, sampling depths, and the appropriate analytical requests.

Soil samples were documented as having WTPH-D or Method 6010 analysis. Water samples were documented as having Method 7421, Method 6010, Method WTPH-D or Method 8020 analysis. Holding times were clearly written and analyses performed within acceptable time frames per standard USEPA protocol.

Page 2

Memo from Nels Cone

Subject: Data Validation, Project 626121

September 10, 1992

Method blanks and laboratory duplicates demonstrated required data consistency. Calculated Relative Percent Differences (RPD) for all sample duplicates were well within established guidelines.

Chromatograms, along with external standard reports, were supplied for all WTPH-D analysis, indicating appropriate methods, instrument calibration times, and operator identification. Surrogate recoveries were within acceptable quality control (QC) limits for all samples and duplicates with the exception of samples MW3-S1, MW4-W1, and MW5-W1. Due to an elevated sample concentration of 9,900 mg/kg (diesel), the surrogate recovery value for MW3-S1 was diluted out during the repeat analysis. For samples MW4-W1 and MW5-W1, chromatograms clearly indicated the presence of diesel. Surrogate recovery for these samples was determined not to be within QC limits due to unspecified matrix interference. However, the values reported showed direct consistency with values reported from surrogate recoveries unaffected by matrix interference. In no way should these two specific data qualifications compromise the value of this data set.

Total lead analysis by ICP was performed on water all samples. Where a concentration was found to be lower than 0.05 mg/l, lead analysis by GFAA was conducted.

The parameters tested produced data with USEPA Contract Laboratory Program (CLP) recommended data qualifiers and values accurately displayed. Accordingly, the reported analytical data values are valid for all standard purposes.

APPENDIX F

Chain-of-Custody Records



**BURLINGTON
ENVIRONMENTAL**

Engineering

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6131

PROJECT NAME <u>NATIONAL GUARD, TOPPENISH</u>						NO. OF CONTAINERS	TYPE OF ANALYSIS										PRESER- VATIVES		REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)	
PROJECT NUMBER <u>626121</u> MAJOR TASK							WTPH-D	LEAD(CPA 6dc)												
SAMPLERS <u>KT</u>																		ICED		CHEMICALS ADDED
LAB DESTINATION <u>SOUND ANALYTICAL SERVICES</u>																				
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION															
MW1-S1	8/11/92					1	X										NEED RESULTS ON 8/21/92			
MW2-S1	8/11/92					1	X										"			
MW3-S1	8/11/92					1	X										"			
MW4-S1	8/12/92					1	X										"			
MW5-S1	8/12/92					1	X										"			
MW6-S1	8/12/92					1	X										"			
MW7-S1	8/12/92					1	X										"			
MW1-S2	8/11/92					1		X									"			
MW2-S2	8/11/92					1		X									"			
MW3-S2	8/11/92					1		X									"			
MW4-S2	8/12/92					1		X									"			
MW5-S2	8/12/92					1		X									"			
MW6-S2	8/12/92					1		X									"			
MW7-S2	8/12/92					1		X									"			

RELINQUISHED BY

RECEIVED BY

SIGNATURE	DATE	TIME	SIGNATURE	DATE	TIME
<i>Koorus Tahghighi</i>	8/14/92	13:00	<i>Jerry Olson</i>	8-14-92	1300
<i>Jerry Olson</i>	8-14-92	1330	<i>SGiang</i>	8/14/92	1300

SHIPPING NOTES FR. Koorus Tahghighi
Burlington Environmental, Inc.
1440 W. Marginal Way, South
Seattle, WA 98108

LAB NOTES

206-767-3306



BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

Engineering

Fax (206) 767-3460

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6132

PROJECT NAME <u>NATIONAL GUARD, TOPPENESH</u>						NO. OF CONTAINERS	TYPE OF ANALYSIS				PRESERVATIVES		REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
PROJECT NUMBER <u>626121</u>			MAJOR TASK				WTPH-D (EPA 8015 Mod.)	BTX (EPA 602)	Total Lead (EPA 7421)	ICED	CHEMICALS ADDED		
SAMPLERS <u>KT</u>													
LAB DESTINATION <u>SOUND ANALYTICAL SERVICES</u>													
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION								
MW4-W1	8/13/92					1	X				X	X	NEED RESULTS ON 8/21/92
MW5-W1	8/13/92					1	X				X	X	"
MW6-W1	8/13/92					1	X				X	X	"
MW7-W1	8/13/92					1	X				X	X	"
MW4-W2	8/13/92					2		X			X		"
MW5-W2	8/13/92					2		X			X		"
MW6-W2	8/13/92					2		X			X		"
MW7-W2	8/13/92					2		X			X		"
MW4-W3	8/13/92					1			X		X	X	"
MW5-W3	8/13/92					1			X		X	X	"
MW6-W3	8/13/92					1			X		X	X	"
MW7-W3	8/13/92					1			X		X	X	"

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>Koorus Tahghighi</i>		8/14/92	13:00	<i>Jerry Olson</i>		8/14/92	1300
<i>Jerry Olson</i>		8/14/92	1330	<i>Siang</i>		8/14/92	1300
SHIPPING NOTES <u>FR. KOORUS TAHGHEGHI</u> <u>BURLINGTON ENVIRONMENTAL, INC.</u> <u>7440 W. MARGINAL WAY, SOUTH</u> <u>Seattle, WA 98108 (206) 767-3306</u>				LAB NOTES			



**BURLINGTON
ENVIRONMENTAL**

Engineering

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6130

PROJECT NAME <u>NATIONAL GUARD, TOPPENISH</u>						NO. OF CONTAINERS	TYPE OF ANALYSIS <i>Dissolved Lead (EPA 7421)</i>										PRESER- VATIVES		REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
PROJECT NUMBER <u>626121</u>				MAJOR TASK													CHEMICALS ADDED		
SAMPLERS <u>KT</u>																			
LAB DESTINATION <u>SOUND ANALYTICAL SERVICES</u>																			
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION														
MW4-W4	8/13/92					1	X								X			NEED RESULTS ON 8/21/92	
MW5-W4	8/13/92					1	X								X			"	
MW6-W4	8/13/92					1	X								X			"	
MW7-W4	8/13/92					1	X								X			"	

RELINQUISHED BY

RECEIVED BY

SIGNATURE		DATE	TIME	SIGNATURE		DATE	TIME
<i>Koorus Tahghigh</i>		8/14/92	13:00	<i>Jerry Olson</i>		8/14/92	1300
<i>Jerry Olson</i>		8/14/92	1330	<i>SEiang</i>		8/14/92	1300
SHIPPING NOTES <u>FR. KOORUS TAHGHIGH</u> <u>BURLINGTON ENVIRONMENTAL, INC.</u> <u>7440 W. MARGINAL WAY, SOUTH</u> <u>SEATTLE, WA 98108 (206) 767-3306</u>				LAB NOTES			